Railway Age

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Industrial and Railroad Stocks

EXPERIENCE during recent years, and especially during recent weeks when stock market prices have fluctuated so violently, has shown that prices of railway stocks are much more stable than those of industrial stocks. The profits, real or on paper, made by investing in railroad stocks have been much less than those made by investing in industrial stocks; but the losses incurred by the owners of railroad stocks during the recent break in the stock market must have been relatively very small compared with those incurred by holders of industrial stocks. Every investor wants security as well as profits. It seems probable that for some time to come many investors will attach more importance to security and less to the prospect of huge profits than in the recent past. If this should be the case the demand for railroad stocks should increase as compared with that for industrial stocks.

Fluctuations in Industrials and Rails

The differences between the changes that have occurred in the prices of railroad and industrial stocks during the last eight years, and especially within recent weeks, have been remarkable. The average prices of 20 railroad and 20 industrial stocks which have been compiled and published by Dow-Jones & Company over a long period of years, afford the best available basis for comparisons. In 1921 stocks of all classes declined to the lowest prices since the war. The highest level reached subsequently was on September 3. The Dow-Jones average of industrial stocks was then 497 per cent higher than when at its lowest point in 1921, while the average of railroad stocks was 189 per cent higher than at the lowest point in 1921. In other words, the prices of railroad stocks at the climax of the bull market were about three times as high as when they struck bottom in 1921, while those of industrial stocks were about six times as high. It certainly did look during most of the time the big bull market was under way as if those who had pinned their faith to railroad stocks were making a great deal less money than those who were backing industrial stocks.

There was a somewhat different story to tell after the big break in the market occurred. Between September 3 and October 29 the Dow-Jones average of railroad stocks declined 22 per cent, while the average of industrial stocks declined 40 per cent. On October 30 and 31 a substantial advance in prices occurred; but even after this the average of industrial stocks was still 28 per cent below the high point reached in September, while the average of railroad stocks was only 15 per cent below it. Investors in industrial stocks who bought them some years ago could congratulate themselves when the market closed last week that the prices of their stocks were still relatively much higher than those of railroad stocks. The highest Dow-Jones average of industrial stocks in 1921 was 81.50, and when the market closed last week it was 273.51 or 236 per cent higher than in 1921. The highest average of railroad stocks in 1921 was 77.56, and the Dow-Jones average on the last day the market was open last week was 159.82, or only 106 per cent higher than in 1921.

It will be interesting and instructive, however, to observe future trends. The net earnings of industrial companies unquestionably have increased much more since the depression of 1921 than have those of railroad companies; but this does not appear to be the only reason for the relatively greater advance in the prices of industrial stocks. There has been far greater speculation in industrial than in railroad stocks, and this unquestionably has been largely responsible for the greater increase in their prices than in those of railroad stocks. Apparently, also, the greater increases in the prices of industrial stocks have been partly due to the fact that industrial companies generally have paid out a larger part of their net earnings in dividends than have the railroads.

Railroad Stocks Less Speculative

On the whole, it would appear that railroad stocks have been and still are on a much less speculative basis than industrial stocks. The net earnings of railroads are limited by regulation, while those of industrial companies are not. On the other hand, the financing of railroads, partly because they are subject to regulation, has been more conservative than that of industrial companies. The facts as to the expenses and earnings of railroads are more readily available, and investors in railroad stocks are much more likely to know what they are getting for their money than the investors in most industrial stocks.

All is not gold that glitters—as many who have recently bought stocks at high prices are now painfully

aware. The recent huge speculation in stocks and its outcome seem likely to cause investors who investigate and think to increase the favor with which they regard railroad stocks and correspondingly to reduce their inclination to seek to make fortunes quickly in the more volatile industrial stocks.

Does the Railway Man Read Advertisements?

ON another page there appears an address given by C. F. Stoltz, signal engineer of the Big Four, before a recent meeting of advertising men in which the author displays a keen knowledge of industrial advertising. From time to time the *Railway Age* has published editorials emphasizing to its readers the mass of valuable material which is published in its advertising as well as its editorial pages and the economy of time and money resulting both to the railway organization and to the advertiser through the use of advertisements as a part of the purchasing method on the one hand and as a part of the selling program on the other.

This engineer through his constructive discussion and criticism of industrial advertising, answers the question of whether, and to what extent, railway officers who have a part in the purchasing plans of their company read advertisements published in the technical and trade magazines in their field. His answer to the question of "What the Railway Man Expects from Advertising" suggests more than a casual reading of advertisements —it indicates a thorough study. The plan to which he refers of filing magazines and advertisements for use when his road is in the market for some particular type of equipment indicates, if it can be taken as a cross section of practice on the larger railways, a more complete examination of technical advertising than is generally supposed.

In the past an idea has been widespread, but is fast being dissipated, that technical subjects do not lend themselves to the creation of attractive advertisements through the liberal use of illustrations and other devices. It is true that it may be a little difficult for the manufacturer of track bolts, for example, to appeal to the personal desires and pride of possession of the railway officer in the same way that the manufacturer of radios can appeal to his audience, but is not the engineer more receptive to a well-constructed advertisement than to one which presents a drab appearance? Mr. Stoltz cites examples which should dispel all doubt of the value of care and attention to detail in the preparation of advertising copy. His address contains instances of obvious errors in illustrations which, while probably not deliberate underestimations of the powers of observation of railway men, must surely have defeated the advertisement's purpose and have rendered the space which it occupied of comparatively little value to the supply manufacturer.

Harmful Competition

THE charge often has been made that the railroads are their own worst enemies. There has been much complaint from railroad sources because the Interstate Commerce Commission has made general reductions and "downward readjustments" of rates when the railways were failing to earn a fair return. The answer sometimes has been made by shippers, and even by officers of railways, that reductions of rates initiated by individual carriers because of inability of groups of carriers to agree, often are equally responsible for the generally downward tendency of rates.

The controversy over grain rates that is now occurring, and the general reduction of these rates that is threatened, illustrates that competition in rates has not been destroyed, and that it may sometimes be more costly to the railways than government regulation. Grain rates, especially in western territory, have been under attack for years upon the ground that they were excessive as compared with the rates on other commodities, and that reductions in them should be made for the benefit of the farmers. The railways have opposed the reductions advocated. Apparently they had convinced the Interstate Commerce Commission that they should not be made.

There have been for some time, however, differences between the Kansas City Southern and other southwestern carriers regarding rates on export wheat from Kansas City to the Gulf. The Kansas City Southern has contended that rates have been so adjusted that it could not get a share of the export traffic to which it was entitled. Last spring it announced that it proposed to reduce the export rate from Kansas City to the Gulf 7 cents per 100 pounds. At just about that time the emergency reduction of 11 cents asked by the national administration was made. When the emergency reduction expired the Kansas City Southern again announced a reduction of 7 cents, which it put into effect on October 1.

Repeated conferences regarding the matter have been held by traffic officers and chief executives of the various railways in an effort to reach an agreement. These conferences have been unsuccessful. In consequence, the reduction is to be met by all the southwestern carriers. There is a close relationship between rates from the wheat producing territory to the Gulf ports and the Atlantic seaboard ports. Consequently, the lines extending to the Atlantic seaboard are now confronted with the question of whether they should meet the reduction. If they do, all export wheat will be carried by the railways at reduced rates.

Only a comparatively small part of the entire wheat crop of the United States is exported. Export rates cannot, however, be considered entirely without regard to domestic rates. If there is a general reduction of export rates there is sure to be an increased demand for reductions of domestic rates upon the ground that if the carriers can afford to make such low export rates

they can afford to make proportionately low domestic rates. Thus, directly or indirectly, the farmers may get as a result of railroad competition, the general reduction of rates on wheat that the railways for years have been telling the public and the Interstate Commerce Commission that they could not afford to have made by regulation. There is a relationship between the rates on wheat and coarse grain; and it is not inconceivable that the rates on coarse grain will finally be affected by the inability of the southwestern railways to agree upon export rates on wheat.

This is far from being the first time that developments of this kind have occurred; and it is to be feared it will not be the last time. All over the country, and especially in the gest there are rates that have been made or kept too low because individual lines have taken the initiative in reducing them or preventing them from being advanced. In many territories the railways are rendering unnecessary passenger service because one or more lines will not agree to curtail it.

The explanation is only too simple. The officers of individual lines are very prone to believe that anything is right which they assume will promote the interest of their own lines, and to act accordingly, and largely in disregard of the probable ultimate and broad effect upon the railroad industry as a whole. It would be easy to cite almost innumerable instances in which groups of railways or the entire industry have been seriously injured because railways have decided to fight out their differences instead of settling them, but it might be difficult to cite a single instance in which any railway has gained anything by assuming an uncompromising attitude the almost inevitable result of maintaining which would be wholly unnecessary increases of railway expenses or reductions of railway earnings. Competition between railways is, no doubt, desirable; but it takes numerous forms and has numerous results that are neither in the interest of the railroads nor of the public.

Can Our Track Be Improved?

MODERN track, comprising rail of 130-lb. or similar sections, heavy joint bars, heat-treated bolts, tie plates, rail anchors, large pre-adzed ties of treated wood in heavy rock ballast, is a thing of enormous strength in comparison with its counterpart of pioneer days. But stripped of its refinements, it is still the track of 75 years ago. The difference lies in the fact that each of its component parts has been greatly strengthened.

In the development of each of these component parts, much time, thought and expense have been applied, some through the wasteful process of trial and error, but much through a truly scientific approach. In the main, however, the advance has been made in one unit of the structure, independent of its relation to any other. As a consequence, each unit is constantly being improved and strengthened, and it may be that the present form of track is the best that can be devised.

But some railway men are beginning to ask whether certain deviations from the conventional track construction may not offer possibilities of greater strength and permanence and lower maintenance costs. With the exception of the experiment with the concrete roadbed on the Pere Marquette, and perhaps also the welding of rail ends on German railways for the purpose of eliminating joints, nearly all experimental effort has been confined to tests of one detail or another, embodying no marked change from the general nature of the structure. Investigations of track stresses have necessarily been confined to studies and tests of what is virtually standard track construction.

Is the time not ripe for a critical, basic study of the track as a whole, which will embrace all possible deviations from present designs and practices? The recent announcement of one large system of its intention to spend twenty million dollars in the next year for rails and rail fastenings alone is surely an indication of the enormous possibilities involved. Perhaps such an investigation may lead to no marked departures from present designs or practices, but even a minor improvement evolved in the course of research would pay for the cost of such studies many times.

Professor Irving Fisher on Railroad Cost Accounting

PROFESSOR IRVING FISHER of Yale University has placed himself on record as an advocate of cost accounting for railroads in a syndicated article which appeared in a number of newspapers. Considering Professor Fisher's reputation as a disinterested student of economic and industrial problems, his opinions on this question and the reasoning which he sets forth in support of them are somewhat surprising.

Says Professor Fisher: "The charge for a particular service is determined mainly by the value of the service to users. But the cost to the producer of rendering the service must also be given full consideration if rates are to be apportioned fairly among different services, different areas, and different classes of shippers."

There can be no question that accurate costs, if they could be determined, would show much less variation among commodities than is shown by the rates charged for their transportation. Referring to the recent study of Dr. M. O. Lorenz on the ratio of freight charges to the value of various commodities at destination, we find freight charges varying from 0.14 per cent of value for copper ore to 61 per cent for fresh grapes. Distance, to be sure, is not taken into account in this study, but it is perfectly obvious from it that freight rates are an extremely important factor in the marketing of some commodities and relatively unimportant in the case of many others. Does it seem likely

that cost of service, if it could be currently determined, could be given any greater weight than it now receives without seriously affecting the movement of some commodities which could not stand higher rates and bringing into effect reductions on many commodities upon which freight rates are a burden so light as to be almost imperceptible?

Knowledge of actual costs of moving specific commodities can be, generally speaking, of practical service only where a question of confiscation enters in; it is simply a standard below which railroad rates cannot lawfully be prescribed. Approximate costs of handling particular commodities can be obtained in the relatively few cases where such knowledge would be helpful by making special cost studies; indeed, such special studies, since they can comprehend special local conditions as no general routine accounting plan could, offer the *only* method by which even approximate costs can be obtained. Would Professor Fisher saddle the railways and the shipping public with the enormous cost of routine cost accounting when its practical application in rate making is plainly so slight?

"In other industries the ascertainment of unit prime costs has measured the efficiency of production. By comparative records it has shown whether materials and labor were being more economically used"—thus Professor Fisher writes. He might also have added, however, that probably no other industry has so many non-monetary indices of efficiency in constant use as have the railways. Car-miles per car-day, net ton-miles per car-day, gross and net ton-miles per train hour, per cent loaded to total car miles, pounds of coal per thousand gross ton-miles—are these and the many other indices regularly used by the railways any less accurate measures of comparative operating efficiency than they would be if given in dollars and cents?

"The Taylor Society" writes Professor Fisher, "has aided Mr. Joseph B. Eastman in drafting a proposed report on which counsel for the railways, shippers and others interested are busily preparing briefs . . . " This is an interesting statement which is not, to our knowledge, of record in *Ex Parte 91*. In setting forth the participation of the Taylor Society in this case, it is unfortunate that Professor Fisher did not include the testimony of John H. Williams, one of that society's leading witnesses, to the effect that a continuous cost accounting system intended to produce actual costs would be "an absurdity" and that if such were attempted it "would just mess you up and make nothing but trouble for you. It would drive you insane."

"Nobody," writes Professor Fisher, "disputes the desirability of some uniform system of continuous routine cost accounting on the railroads." This statement is not in harmony with the testimony of Mr. Williams quoted above. We ourselves could name a great many men who are more familiar with railroad accounting than is Professor Fisher whose views likewise do not harmonize at all with his positive statement. Moreover, even a cursory perusal of the record in *Ex Parte 91* ought to have disclosed to Professor Fisher a considerable volume of testimony disputing that which he says "nobody disputes."

Do Not Forget the Human Factor

MANY leaders in business today are stressing the necessity for management to adopt a social viewpoint in gaging the efficiency of any business enterprise. They contend that in the past, too much emphasis has been placed on economics and that the tendency has been to disregard the human values involved. Intelligent management today, however, recognizes the newer viewpoint. It is a well-recognized fact that employee morale plays an important part in the success or failure of any enterprise. This more or less intangible factor is improved substantially by leadership which is based upon an understanding of human behavior.

Obviously it is mighty important to know something of human nature in order to lead others. A great student of human behavior has said that the study of human nature, more technically known as the science of human behavior, is the most important undertaking of the mind. Mistakes in the appraisal of personalities are sometimes costly, and hence the importance of knowing something about how individuals react under the stimulus of their environment is manifest.

In speaking before the recent convention of Master Car Builders and Supervisors at Chicago last month Dr. Stevens, professor of psychology at Northwestern University, succeeded in bringing his audience to a realization of the importance of this subject. One of the most pertinent of his remarks, although not new by any means, merits repetition here. "I have always insisted that for any one to lay claim to even the right to supervise, handle and control other human beings, he must first have learned to control himself," said Dr. Stevens. Continuing further, Dr. Stevens commented on a fundamental principle in the handling of men: "Only a small-minded and basically inferior individual need ever be afraid of the good work that someone slightly lower in the scale of jobs will do. Yet I find in my work in industry and factories of one kind or another, that here is one of the greatest causes for difficulty between supervisors, foremen and the like. It is a fear on the part of men higher up that men who are responsible to them will show them up, or make them appear less effective than they ought to be."

When a railroad association engages a speaker of Dr. Stevens' caliber, it indicates that railroad officers are keenly alive to the importance of this subject. More papers and informal talks on this, or related subjects, should be presented at conventions attended by railroad men.

Operations Have Been Aided Materially by the Heavy Improvement Work

Cashing in on Improvements

Rehabilitation of the Denver & Rio Grande Western results in operating efficiency

Part II

BY adapting its operating methods to the improved facilities, the Denver & Rio Grande Western has been able to reduce its operating ratio, from an average of 84.34 per cent for the four years ending with 1924, to an average of 73.85 per cent for the four years ending with 1928, and to 73.33 for the first five months of 1929. This was effected by a decrease of 4.46 in the transportation ratio, 1.08 in maintenance of way, and 5.63 in maintenance of equipment, as illustrated in the graphic chart, shown as Fig. 1, while the details are given in Table 1. It should be remembered that these showings were made despite the handicaps to operation brought about during the heavy construction program, described in Part I of this article, which appeared in the *Railway Age* of Nov. 2.

Table 1.—Operating Ratios

	1921	1922	1923	1924	1925	1926	1927	1928	5 mos. 1929
M. of W. & S.	19.69	14.99	16.00	18.56	17.08	17.34	20.37	18.61	15.53
M. of E.	24.20	22.70	27.91	27.72	17.69	18.34	18.44	18.57	20.74
Traffic	1.58	1.63	1.71	1.87	1.94	1.99	2.08	2.12	2.38
Transportation	34.59	34.83	36.71	34.47	32.22	30.28	30.43	30.13	30.09
Miscellaneous operations	1.87	1.85	1.94	1.74	1.85	1.65	1.62	1.43	1.18
General	3.16	2.99	2.93	3.13	3.10	3.09	3.17	3.15	3.54
Transportation for investment—credit	.04	.12	.38	.88	.15	.36	.39	.39	.13
Total	85.05	78.87	86.82	86.61	73.73	72.33	75.72	73.62	73.33

One of the most important results has been the large reduction made in the number of train accidents. The better track conditions have permitted the operation of much heavier trains, at higher speeds, and, at the same time, have reduced the hazards. Equipment damage caused by accidents has been reduced more than 50 per cent since 1924, and the showing so far this year indicates that still further reduction will be made.

Transportation Costs

By changing operating methods to take advantage of the changed physical conditions, much crew overtime and many train delays have been eliminated. The extent to which improved operation has been possible is indicated by the fact that the average wage cost per 1,000 gross ton miles for the four years ending with 1924, was 58.5 cents, whereas, for the four years ending with 1928, this average cost was reduced to 45.9 cents. In the first five months of this year, it was still further reduced to 40.4 cents, which compares highly favorably with 1921, for example, when the cost was 63.0 cents.

These savings have been brought about by running heavier trains, and by the elimination of delays. In the latter case, the saving may be better appreciated when it is realized that permanent slow orders, covering many miles of track, have now been entirely eliminated. Disastrous delays and interruptions to traffic from rock slides, wash-outs and other natural hazards incident to

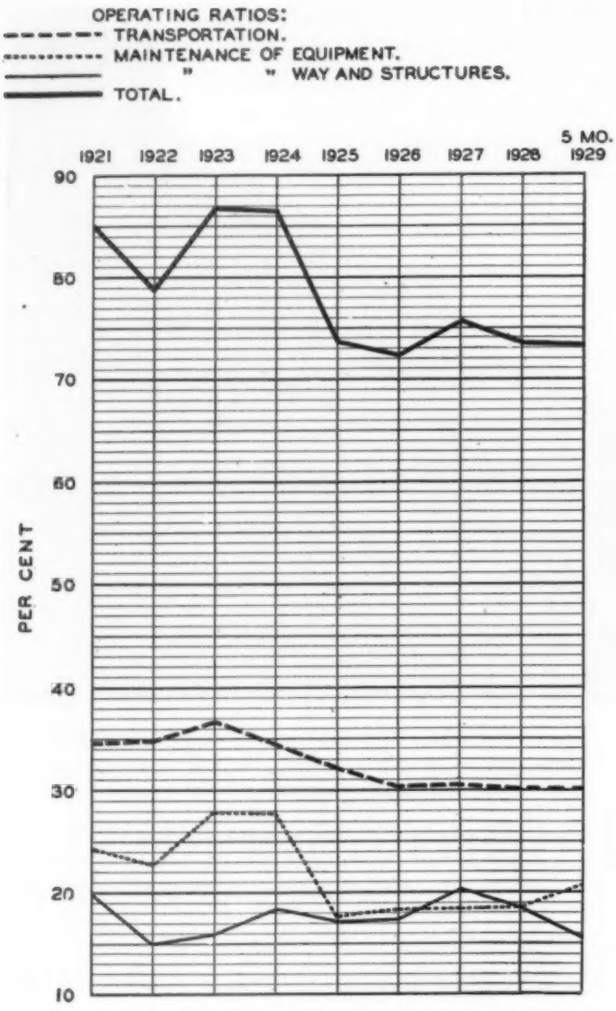


Fig. 1. All Factors of the Operating Ratio Show a Downward Trend

mountain operation have also been reduced materially. The roadway improvement program has enabled a reduction of 16 men in the staff of track watchmen formerly required to patrol the line on the lookout for rock slides and wash-outs.

The equipment rehabilitation program was paralleled by a campaign to reduce fuel costs, which has been most successful. The average fuel cost per 1,000 gross ton miles for the four years ending with 1924 was 43.2 cents, with a high mark of 47.9 cents in 1923. For the following four years, it averaged 27 cents, with a low mark of 24 cents in 1928, and, during the first five months of this year, the cost has been only 21.7 cents, representing more than a 50 per cent reduction.

This showing has been followed, of course, by a material reduction in total transportation costs, which, in 1921 were 247.4 cents per 1,000 gross ton miles, and, in 1928, 146.3 cents, a reduction of 101.1 cents, or more than 40 per cent. The detailed figures covering these cost reductions are given in Table 2.

Operating Performances

As mentioned in Part 1 of this article, freight train performance has matched the improvement in track conditions. Fig. 2 shows the ascending curve of the three essential factors of freight train performance; namely, average train load, average train speed and gross ton miles per train hour, while Table 3 shows the details of the improvement brought about in freight train costs from year to year.

This increased operating efficiency was obtained by using heavier power on the rebuilt sections of the line, as soon as the reconstruction work was finished, until heavy tonnage trains are now used on all main lines.

Freight car performance has kept pace with the other operating improvements. The miles per car per day have increased from an average of 16.1 miles for the four years ending in 1924, to 22.0 miles for the similar period

Table 2.—Freight Train Costs per 1,000 Gross Ton Miles

	Wages	Fuel	Total Transportation
1921	$.63	$.454	$2.474
1922	.596	.426	2.245
1923	.60	.479	2.312
1924	.515	.369	2.052
1925	.503	.323	1.806
1926	.465	.271	1.579
1927	.451	.247	1.512
1928	.418	.240	1.46
1929—five months	.404	.217	1.463

ending in 1928, and to 22.2 miles for the first five months of 1929. Net ton miles per car day for the period ending in 1924 averaged 301, as compared with 387 for the following four years, and 422 for the first five months of 1929. These figures include all cars, both standard and narrow-gage. The net car load and the percentage

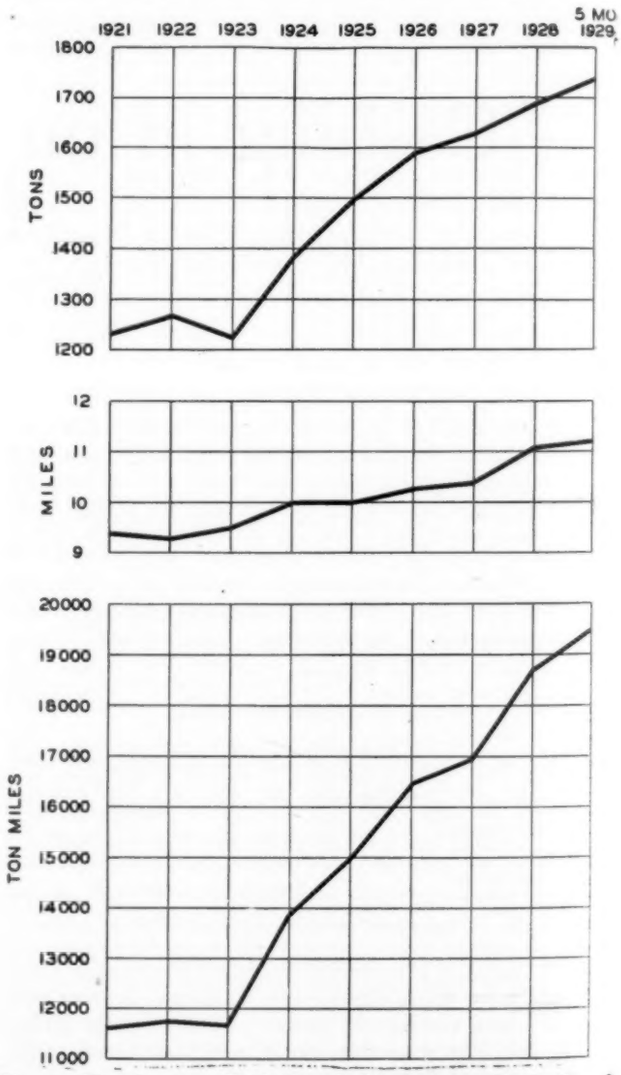


Fig. 2. The Average Train Load, the Average Train Speed and the Gross Ton Miles Per Train Hour

of loaded to total car miles has remained relatively the same, for the reason that the increase in through business has brought about an increased movement in commodities of light loading, such as perishables, which also are loaded in special purpose cars that must be returned empty.

The details of freight car performance are shown in Figs 3 and 4 and in Table 4.

The more efficient car performance on the main line, where most of the improvements were carried out, is

Table 3.—Freight Train Performance

	Average train load	Average train speed	Gross ton-miles per train-hour
1921	1,232	9.4	11,609
1922	1,267	9.3	11,771
1923	1,225	9.5	11,696
1924	1,383	10.0	13,852
1925	1,500	10.0	14,972
1926	1,590	10.3	16,438
1927	1,625	10.4	16,919
1928	1,686	11.1	18,667
1929—five months	1,740	11.2	19,475

even more striking. For example, the average miles per day of all foreign cars was 43.8 in 1925, and 51.6 in 1928; excluding unserviceable and stored, it was 51 in 1925 and 66.3 in 1928.

The better condition of the cars is responsible for much of this improvement. The steadily diminishing number of bad order cars has had its effect on the miles per car per day. Other factors entering into the improvement are improved methods of car distribution and terminal operation and the increased train speed.

Passenger train performance has kept pace with the freight train improvement. From a record of 84.8 per cent on time in 1926, the figures were increased to 93.3 per cent for 1928, and 95.6 per cent for the first six months of 1929.

Operating Methods

One of the handicaps to efficient operation on the main line has always been the necessity for frequent and expensive helper service over the mountain grades.

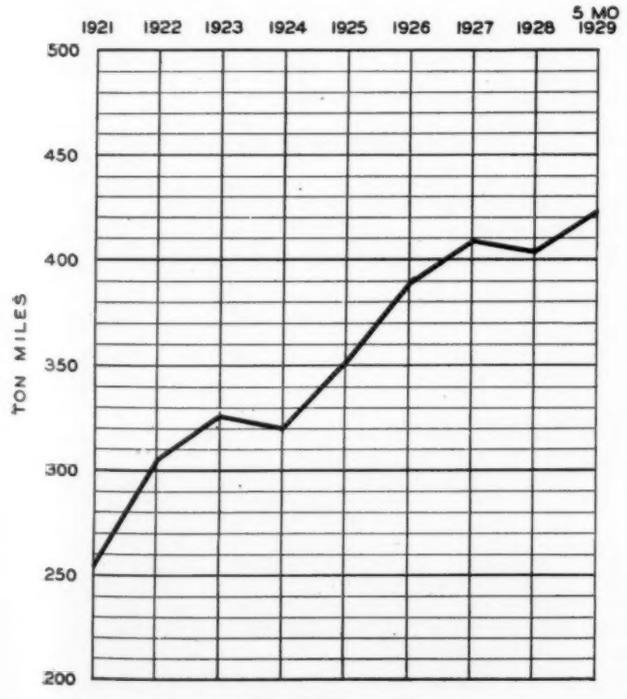


Fig. 3. The Net Ton Miles Per Car Day Show a Notable Improvement

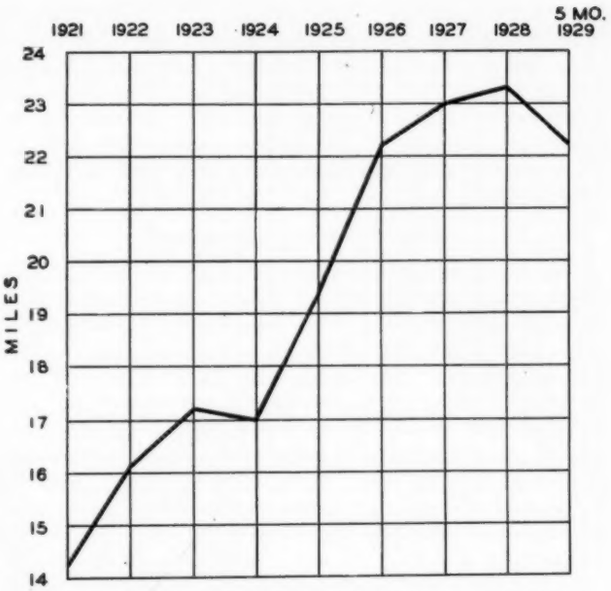


Fig. 4. Better Operating Conditions are Indicated by the Miles Per Car Per Day

As a result of the improved track conditions, permitting the operation of heavy power, the helper station at Glenwood Springs, Colo., which formerly supplied helpers to all eastbound freight trains, has now been entirely eliminated.

Formerly all westbound trains required helpers from Helper to Soldier Summit, 25 miles, on the grade of 2.4 per cent from Helper to Kyune, 13 miles, and one per cent from Kyune to the summit. With the heavier power in service, only the heaviest trains now require helpers, and these only from Helper to Kyune, where a wye has been built on which helpers turn and go back

Table 4.—Freight Car Performance

	Net car load	Car-miles per car-day	Per cent loaded to total car-miles	Net ton-miles per car-day
1921	27.5	14.2	64.9	254
1922	28.3	16.1	66.9	305
1923	27.8	17.2	68.2	326
1924	27.3	17.0	68.8	320
1925	26.5	19.4	68.3	351
1926	25.9	22.2	67.2	388
1927	26.5	23.0	67.0	408
1928	26.0	23.3	66.6	403
1929—five months	27.8	22.2	68.4	422

to Helper. Also the return movement of helpers has been much facilitated by signaling this portion of the double-track lines for either direction operation.

On eastbound freight trains, helpers are still used from Thistle to Soldier Summit, 29 miles, on a 2.0 per cent grade, but most of the passenger trains are now handled up this grade without helpers.

In all, the D. & R. G. W. has greatly reduced the number of helper engines in the past four years. As a result of this reduction in helpers, and the generally improved operations, one engine district will be eliminated this year. The present engine districts on the western half of the D. & R. G. W. are:

Grand Junction—Green River	106 miles
Green River—Soldier Summit	96 miles
Soldier Summit—Roper	91 miles

Under the revised arrangement, these engines districts will be consolidated into two, Grand Junction—Helper, 177 miles, and Helper—Roper, 116 miles.

The operating improvements have also permitted a greater utilization of power. In 1924, 1.44 engines were required per train mile, as compared with 1.33 in 1928.

The new passenger locomotives are now operated through between Denver and Salt Lake, 745 miles, while freight engines now operate over two or three former engine districts, thus bringing about a material reduction in engine terminal expense. Despite the unfavorable character of the country traversed, with the heavy grades and curvature, these long runs have been entirely successful.

The Terminal Situation

The two principal interchange points are at Salt Lake City and Ogden, Utah, and Denver and Pueblo, Colo. In 1928, arrangements were made at Pueblo and Salt Lake City terminals which have reduced the terminal time materially. At Pueblo, the D. & R. G. W. and Missouri Pacific terminals were consolidated on April 1, 1928, and arrangements for speeding up the interchange, particularly with reference to perishable traffic, were made at that time. Comparative figures show that the improved operating methods made possible by this consolidation have cut the terminal time at Pueblo approximately in half.

At the west end of the railway, the terminal facilities were inadequate, resulting in frequent delays. This was true at both Ogden and Salt Lake City. At the latter point, only a small yard was available, and it was situated in the busy downtown section. To remedy this situation, an entirely new yard was built at Roper, three miles south of Salt Lake City, and all interchange operations at the west end of the railway have been consolidated there.

The Western Pacific operates directly into the yard, and the interchange with it is made there, while transfer runs take care of the interchange with the Union Pacific. Cars for the Southern Pacific, which does not operate south of Ogden, are handled by turn-around runs between Roper and Ogden, 40 miles, as the business demands.

Switching is facilitated at Roper by a slight down grade from each end of the yard toward the center, which makes it a semi-hump operation. The increased facilities have made it possible to do much more classification work on the eastbound trains than was formerly possible, with the result that much intermediate yarding has been eliminated. Since Roper yard was opened, on August 10, 1928, there has been no occasion to hold out cars or trains from Salt Lake City.

By insuring dependable operations, without interruption, the D. & R. G. W. has effected these economies. It is perhaps even more important to keep the main line open on this railroad than on any other, for, because of its peculiar geographical position, the only possible detour, if the main line were out of commission, is to operate trains on another railway over the entire distance between Denver and Salt Lake City, at extremely heavy expense.

The improved operations recorded herein were accomplished while the roadway improvement program was going on, and even more efficiency is expected after the work has been completed and the interference of work trains eliminated.

YALE UNIVERSITY, New Haven, Conn., announces that a scholarship, provided for mostly by contributions from railroad men, is to be offered at the University in memory of the late Edward J. Pearson, former president of the New York, New Haven & Hartford. The scholarship, worth $600 a year, will be open to an employee of the New Haven or the son of an employee.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended October 26 amounted to 1,133,810 cars, a decrease of 29,164 cars as compared with the corresponding week of last year but an increase of 20,994 cars as compared with 1927. Increases as compared with the corresponding week of both 1928 and 1927 were reported in the loading of livestock, coal, coke and merchandise, and also from the Central Western and Southwestern districts, but the Eastern, Allegheny, Pocahontas, Southern and Northwestern districts reported decreases as compared with 1928 and the Southern and Northwestern districts reported decreases as compared with 1927. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended October 26, 1929

Districts	1929	1928	1927
Eastern	246,432	260,074	245,427
Allegheny	226,762	233,259	215,224
Pocahontas	65,035	65,124	57,808
Southern	156,838	159,746	161,503
Northwestern	158,100	170,487	166,327
Central Western	181,559	180,343	174,359
Southwestern	99,084	93,941	92,168
Total Western Districts	438,743	444,771	432,854
Total All Roads	1,133,810	1,162,974	1,112,816
Commodities			
Grain and Grain Products	42,998	53,070	56,299
Live Stock	38,760	38,019	38,171
Coal	208,005	207,688	182,136
Coke	11,840	10,546	9,287
Forest Products	62,605	67,600	69,299
Ore	50,228	59,389	42,350
Merchandise L.C.L.	270,298	270,020	268,518
Miscellaneous	449,076	456,642	446,756
October 26, 1929	1,133,810	1,162,974	1,112,816
October 19	1,185,510	1,163,135	1,129,055
October 12	1,179,008	1,190,741	1,120,007
October 5	1,179,047	1,187,032	1,102,994
September 28	1,202,111	1,196,965	1,126,903
Cumulative total, 43 weeks	44,556,961	42,928,644	43,637,626

The freight car surplus for the week ended October 23 averaged 111,082 cars, an increase of 3,781 cars as compared with the week before. This included 70,177 box cars, 14,104 coal cars, 17,615 stock cars and 2,951 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended October 26 totaled 77,922 cars, a decrease from the previous week of 4,705 cars and a decrease from the same week last year of 19,735 cars.

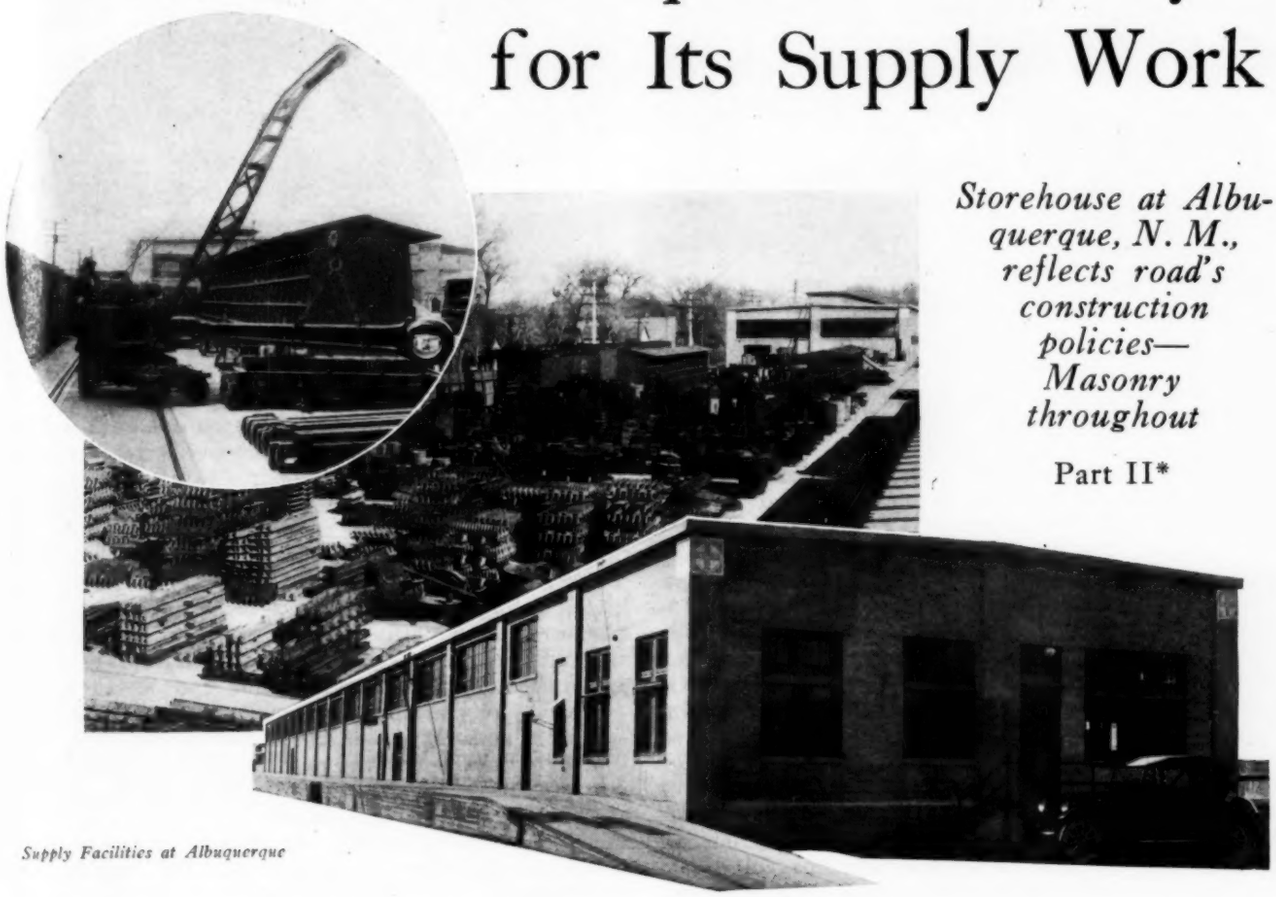
	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
October 26, 1929	77,922	40,377
October 19, 1929	82,627	41,337
October 12, 1929	78,069	42,147
October 27, 1928	97,657	42,661
Cumulative Totals for Canada		
October 26, 1929	2,977,991	1,769,119
October 27, 1928	3,001,015	1,695,425
October 29, 1927	2,751,449	1,618,959

TO RELIEVE CONGESTION resulting from inefficient operation and unexpectedly large government food collections, about 100,000 young Communists, organized on strict military principles, volunteered to spend the three-day holiday which marked the anniversary of the Bolshevik revolution in unloading the thousands of freight cars which blocked the Moscow yards and threatened to cause a serious trffiac jam over a large part of the Russian railroad system.

The Santa Fe Spends Liberally for Its Supply Work

Storehouse at Albuquerque, N. M., reflects road's construction policies—Masonry throughout

Part II*



Supply Facilities at Albuquerque

THE stores facilities of the Santa Fe at Albuquerque, N. M., though constructed several years ago, reflects the substantial and generous way in which the road builds for supply work. The Albuquerque plant is a division rather than a general store, carrying $773,000 of material and issuing $178,500 material a month, of which $125,000 is supplied locally to the large shops there and $53,500 is distributed by freight over 1,000 miles of line.

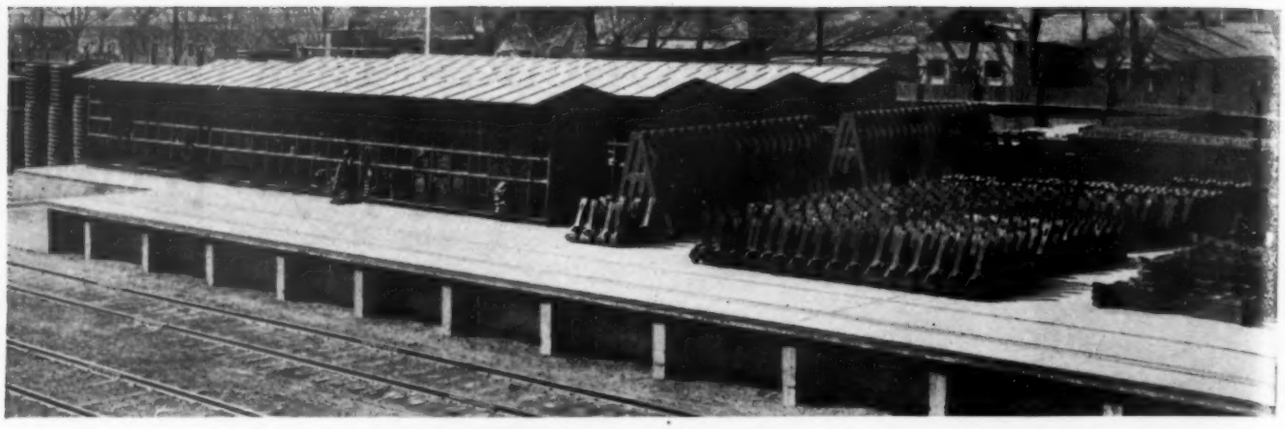
The main store building is a one-story structure of reinforced concrete, 419 ft. long by 50 ft. wide, and is is located near the center of the shop area. The storage portion of the building extends back from the offices and consists of two large rooms separated by a firewall with automatic doors of the fusible link type. The first room is about 200 ft. long and is used chiefly as retail department for the smaller and more valuable materials, which are placed in cases running longitudinally with the building and lettered for the ready locating of their contents. The second room, nearly equal in size to the first, is stocked with bolts, engine hose, friction metals, brass castings, etc. At the south end of the building is a room for oil and varnish supplies. This room is entirely cut off from the rest of the building by a heavy concrete fire wall without doors or other apertures.

The roof and the floor as well as the walls and foundation are of reinforced concrete. The walls are 18 ft. high and are fitted with an almost continuous line of steel sash placed 11 ft. above the floor to afford and unbroken wall space for shelving and at the same time to provide illumination. For additional light, a roof monitor, fitted with steel sash, runs the length of the building, and all inside surfaces are painted white. The building has nearly 5,000 sq. ft. of window glass, giving a ratio of glass to wall of 1 to 70 which is liberal, without taking into consideration the distribution of light afforded by high windows and the white interior. All of the windows are connected in series and are operated from the floor with automatic closing and opening devices for ventilation, while the building is also wired with one hundred 40-watt and three 500-watt Mazda drop lights, operated both by individual pull cords and wall switches.

The maximum height of the material cases in this building is 7 ft. so that all supplies are accessible to workmen standing on the floor. Ample aisles are provided so that all parts of the house are within direct reach of

* The second of a series of articles begun in the issue of November 2.

The New Garage and Battery Charging Room



One End of the Store Platform

trucks, and telephones connect all sections with the office.

The building is heated either from radiators encircling the pillars or, where the space is not available elsewhere, by units installed at the ends of the material cases. Twelve reels of 2¼ in. hose each and a nozzle are installed for fire protection.

Experience has shown that it is not economical to issue paints and oils for local consumption in larger quantities than five or ten gallons. A 50-gal. barrel is too large, for the paint cakes on the inside and outside of the barrel and spills until as much as 20 per cent can be wasted. At Albuquerque the paint is carried in one to ten gallon tins. This is a handy size and the emptied cans make receptacles for shipments to outlying points. For retailing small quantities of oil to the shops, nineteen 120-gal. tanks are installed in the oil and varnish end of the store. Each tank is fitted with a Bowser self-measuring pump that will deliver any quantity from one pint to one gallon and a track is built over the tanks to aid in filling the tanks from barrels. In addition, there are seven large steel tanks in the basement for car oil, flange oil, valve oil, signal oil and engine and coach oil, each fitted with a self-measuring pump installed in the floor of the oil room, while gasoline is pumped from a tank buried some distance from the building. Six steam power pumps connect the large storage tanks in the basement for loading, unloading and transferring their contents from the cars and into drums and barrels for shipment, and two-inch live steam lines lead to all parts of the oil house and basement for the smothering of flames in case of fire.

In the Store Room

The floor of the storehouse is built car door high and the building is surrounded on three sides by a concrete platform 10 ft. wide which connects with the main platform on the south. This platform, also of concrete, is 70 ft. wide and 800 ft. long. Standard gage tracks serve this platform on each side, and its surface is arranged for placing the materials within defined areas which are outlined in black paint.

Electric warehouse trucks, an electric crane and four electric tractors, with trailers of 3,000 lb. capacity, carry the material from one part of this building to another and move it into or out of cars, or between the storehouse and various departments of the shops and car repair yards. The electric crane is particularly valuable in loading and unloading house cars. In addition to this equipment, the Albuquerque store is equipped with a three ton auto truck for hauling large loads between different buildings of the terminal and for transporting local fright and passenger shipments of material to and from the depots.

Over one and a half miles of concrete roads have been laid for the use of this equipment and, just recently, a new garage was built to maintain it. This building is constructed of brick and steel, has a concrete floor and steel window sash, is equipped with steam heat and is capable of charging the batteries for six trucks at one time.

A building 68 ft. wide by 206 ft. long and 17 ft. high at the eaves is maintained at Albuquerque for sheet metal. This building is open only at the front along the unloading track. The sheets are stored on edge in racks made of five rows of 60-lb. scrap rail cut into 9-ft. lengths and set in concrete foundations and they rest on rails embedded in the foundation sills with the ball down. The racks provide 74 pockets, each 31 in. apart for the sheets, and a monorail system is built overhead to handle them. A concrete floor 8 ft. wide is laid lengthwise of the building just inside the open side and the main monorail extends the length of the walk and some distance out from one end of the building where the steel is transferred from cars to the monorail system. Switches are installed along the monorail to connect with monorails extending over each pocket crosswise of the building.

The sheets are unloaded from the car, one at a time, by a crane and swung on edge under the monorail tracks. They are then picked up by one or two clutches

which are hung from chain hoists on the monorail, and are moved along the main rail until they reach the proper switch which is thrown to divert the trolley into the right pocket, when the sheet is lowered and left standing on edge. The switches are thrown by chains which hang to one side of the main track. A safety stop keeps the trolleys from running off the end of each track, while safety guards are also installed at the open ends of the switches. The heaviest sheet of metal handled weighs about 6,000 lb. and is carried by two double trolleys, connected by an iron bar and spaced 48 in. apart. The clutches were especially designed and will pick up a sheet of metal lying in any position without slipping and hold it in a perpendicular position when lifted. Previously all sheet metal was laid flat and the labor and cost of unloading, storing and delivering it to the shops was large. The capacity of the house is 10,000 tons of sheet metal.

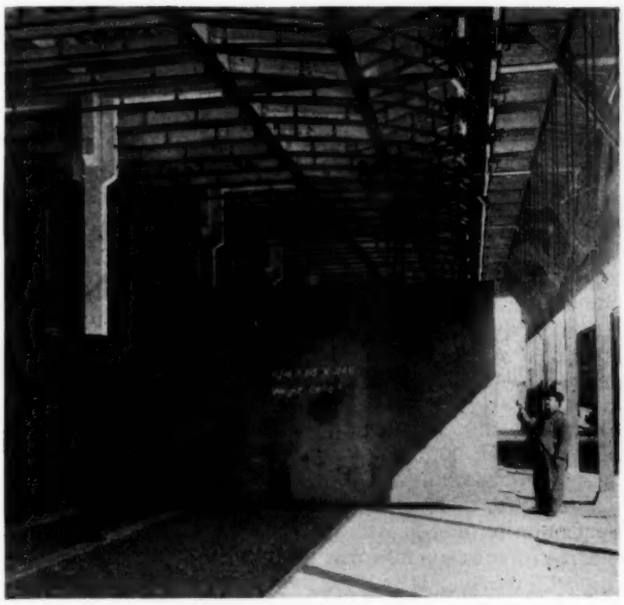
All bar iron at Albuquerque is stored in a separate structure 272 ft. in length and 24 ft. wide. The building is supported on a concrete pier foundation and is 7 ft. high at the back, 9 ft. at the front and 11 ft. at the ridge of the roof. It is enclosed on three sides and has a continuous line of double doors on the front side. The sills of the structure are fastened to the foundation by means of iron dowel pins.

The racks consist of four vertical rows of scrap rail, 8½ ft. long, which are set 2 ft. in the concrete foundation. The racks are built in panels, 15½ ft. in length and run almost the entire length of the building, 1½-in. iron rods dividing them into pockets. At one end of the building 24 ft. of floor space is provided for the storage of iron which is too short for the racks.

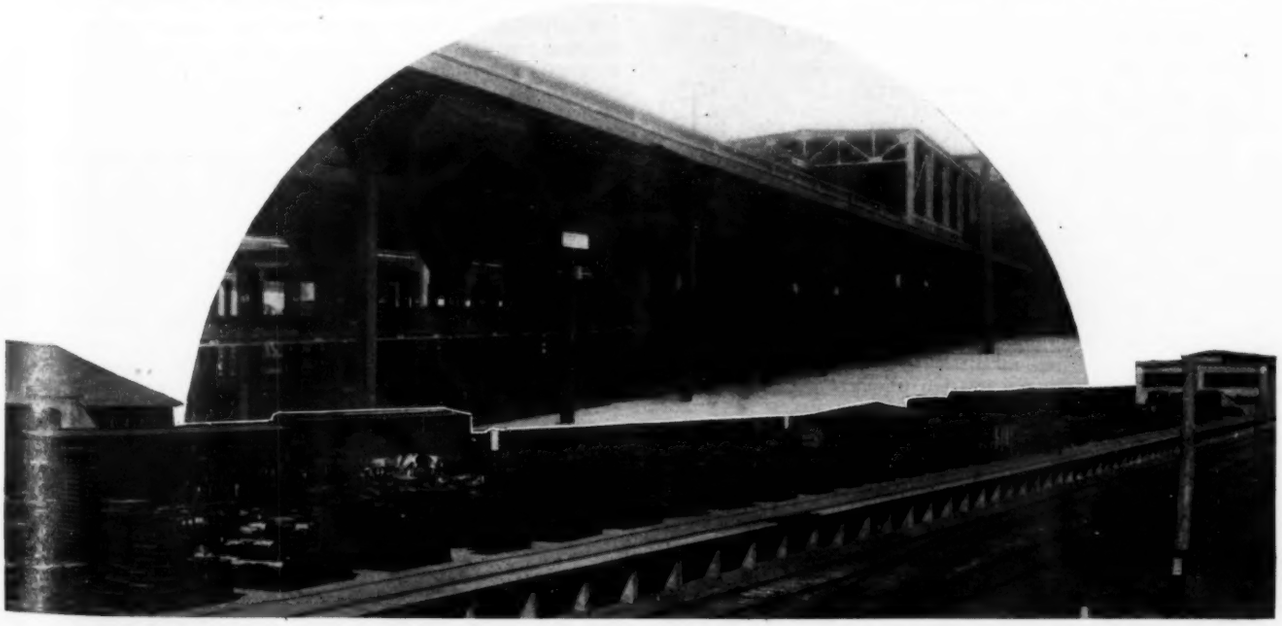
A platform scale, mounted on a car, runs on an outside track for the entire length of the building, facilitating the weighing of incoming and outgoing shipments. A standard gage track is also laid parallel to this scale track, so that shipments may be shifted direct from the racks to the scales and then into a car for shipment. This house is close to the blacksmith shop and supplies of iron can be moved on push cars from the racks direct to the forges, necesitating only one handling of the material. The capacity of the house is 10,000 tons of bar iron of all sizes.

Boiler tubes are stored in a building similar to the bar-iron house. It is 24 ft. by 106 ft. by 11 ft. with a capacity of 16,500 2¼-in. tubes. The house is boarded up at each end, but has double doors in each panel on both sides. The panels are 16 ft. apart and the racks consist of three rows of 60-lb. scrap rail set in concrete foundation, extendings to the top of the building. Tie rods are fastened through holes bored in the upright rails at suitable distances, forming the pockets. The flue storage is served with engine tracks and flues can be loaded on push cars from the racks and sent directly into the boiler shop.

While the lumber storage presents nothing unusual at present, this part of the yard is soon to be completely paved with concrete so that car loads of lumber need not be spotted, but can be unloaded directly on trailers according to its size and length, and thus worked to the proper piles, while all lumber can be moved by tractor and trailer to the wood mill instead of by push car.



Sheet Steel Handling at Albuquerque



The Iron Shed and Materials Platform at Albuquerque

The Railways' View on Revision of Accounting

Counsel for R.A.O.A. files brief with I.C.C.—Naming cost accounting committee called "futile and unnecessary"

A BRIEF, setting forth the position of the railways with reference to the general accounting revision case, *Ex Parte 91*, was filed with the Interstate Commerce Commission on November 8, by E. R. Woodson, counsel for the Railway Accounting Officers Association. The brief, which reviews the evidence in the case, as well as the proposed report written by Commissioner Eastman, serves to clarify and summarize in convenient form the questions at issue in this important case. It is published by the Association in a printed pamphlet of 113 pages.

The brief opens with a preliminary statement which treats historically the development of uniform accounting on the railways, calling attention to the fact that all prescribed classifications heretofore promulgated by the Commission have been developed through the co-operation of the railway accounting officers with the Commission's Bureau of Accounts. It sets forth that substantially the same procedure has been pursued in this case, with the addition that certain commercial, industrial and professional organizations have injected themselves into the proceedings. The National Industrial Traffic League asked to be heard, as did several other commercial and farm organizations, although the latter "do not appear to have participated actively or tangibly in the proceeding." Hearings were begun in November, 1927, and ended a year later. Commissioner Eastman's proposed report was dated August 15, 1929, and November 1 was the last date for filing briefs and exceptions. This date was extended to November 8 at the request of the National Industrial Traffic League.

Cost Accounting

On the subject of cost accounting, the brief reads, in part, as follows:

Notwithstanding that this proceeding was instituted for the purpose of considering the accounting classifications (page 1571 of the record), and notwithstanding testimony by J. W. Roberts (a proponent of cost accounting for the railroads) that cost accounting cannot be amalgamated with the accounting classification (page 84), cost accounting became the principal subject of discussion at the hearing due substantially to the testimony of witnesses J. W. Roberts and L. R. Bitney. The railroads submitted evidence regarding the proposals of those two witnesses. The Taylor Society presented various witnesses who described plans of commercial and industrial cost accounting. However, none of the Taylor Society witnesses undertook to discuss railway accounting.

The fundamental step in attempting to ascertain so-called costs for railroads is the separation of operating expenses between passenger service and freight service. Rules for such a separation are now, and for some time have been, prescribed by the Interstate Commerce Commission. Those rules apparently fall within the jurisdiction of, and the carriers make reports thereunder to, the Commission's Bureau of Statistics—*not* the Bureau of Accounts. It is probably not without some significance that while the railroads were operated under Federal Control, the Commission suspended its requirements for an apportionment of common expenses between freight and passenger services.

The term "cost," as used in connection with railways, has no generally accepted meaning. To illustrate, "cost" is often utilized as being synonymous with "expense." If "cost accounting," as thus used, were called "expense accounting," its limitations would be more apparent.

In its application to railroads, "cost accounting" is not strictly accounting at all, but is a statistical or analytical process for ascertaining so-called costs. The suggestion was made that it would be better named "statistical cost analysis" (page 2792).

Efforts to apply publicly so-called cost accounting to railroads must and ordinarily do begin with the separation of operating expenses as between passenger and freight services. The formula prescribed by the Interstate Commerce Commission for that separation necessarily involves arbitrary bases of apportionment. Any further steps towards determining specific costs must be through the medium of still other formulae or arbitrary bases of apportionment. So-called cost accounting for general and uniform use by railroads would, therefore, inevitably become a pyramiding of formulae, the results being of doubtful accuracy, or at least subject to controversy, and certainly could not or would not necessarily be controlling.

One proponent of cost accounting for railroads predicated his recommendations and suggestions on the premise that "the main purpose of cost intelligence is to aid the management" (page 84 of the record). This phase is disposed of by the finding on page 27 of Mr. Commissioner Eastman's proposed report to the effect that no new system of accounts should be imposed solely for managerial use, that it may at least be doubted whether the Commission would be justified in imposing a new accounting system upon the railroads for the purpose of achieving results in efficiency and economy which their executives believe can be better attained in other ways, and that to justify such action a clear need directly and immediately related to public regulation must be shown.

The other proponent of cost accounting for railroads endeavored to approach the subject from the viewpoint of needs purporting to relate to public regulation. His plan was found by the railroad witnesses to be incomplete, inaccurate, misleading, unduly expensive, and impracticable.

Special Studies Supply the Need

The position of the railroads is that special studies constitute the practical and economical solution of the so-called cost accounting problem for railroads, if indeed there is any such problem and if a need exists for any solution. None of the proposals advanced in this proceeding would eliminate special studies.

The railroads subscribe to that part of the Commissioner's proposed report, page 35, recommending that the Commission find that it is not justified in prescribing any system of continuous routine cost accounting. From the viewpoint of the carriers, no need directly and immediately related to public regulation has been shown; and if such a showing were made, practicability remains undemonstrated and beyond reasonable hope or expectation, particularly in the light of the discussion, consideration, judgment, and experience already devoted to this subject.

The Alternative Plan as proposed by J. W. Roberts, witness for the National Industrial Traffic League, and presented in this proceeding, consisted of skeletonized charts relating entirely to operating revenues and operating expenses.

On page 56 of the record he states that "the traditional structure" of railroad accounting "is four-storied, representing (a) operating revenues and expenses, (b) corporate income, (c) profit and loss, and (d) general balance sheet, or general status, accounts." No mention is made of the fact that this "structure" is and has been five-storied; road and equipment, or capital, accounts must be included.

The charts outlining the alternative plan and presented in this proceeding, did not embrace the road and equipment, income, profit and loss, and balance sheet accounts.

Various bases of apportionment of freight and passenger ex-

penses, or "clearing combination service accounts to individual service accounts" were included in the plan, some of those apportionment bases being: speed-gross ton miles, gross ton miles, allotted structural space, aggregate car days station detention, allotted structural floor space, terminal car days plus cars dispatched, cars dispatched, relative labor charges, distributed yard locomotive mileage, etc. On page 810 of the record, Mr. Roberts testified that the various bases of apportionment included in his plan were not his recommendations. On page 913, Mr. Roberts counsel stated, "We do not know whether that is the proper basis or not." According to pages 1062-1067, 1073-1075 of the record, Mr. Roberts, under examination by his counsel, undertook to advocate the bases of apportionment as his, or the League's, recommendations. On Page 1067, Mr. Roberts stated, "We have confidence in these bases." On page 35 of the Commissioner's proposed report, it is indicated that the bases of apportionment were not advocated "with entire confidence."

The present reports of carriers show *average* cost for transporting all freight, and that is all the alternative plan would show (Mr. Roberts, page 1013).

Mr. Roberts stated that the alternative plan would not publicly display costs for manufacturing done by carriers (page 1000).

The alternative plan would not dispense with special studies. "We can't hope to do that" (Mr. Roberts page 119).

The brief proceeds to discuss the testimony of J. E. Slater, secretary and treasurer of the Brown Boveri Electric Corporation, on the so-called "alternative plan." Mr. Slater, who has had many years of experience as an analyst of railroad performance, was invited as a witness at the suggestion of representatives of the National Industrial Traffic League and his testimony was quoted at some length in the *Railway Age* of March 31, 1928, page 738. His opinion of the plan was in the main unfavorable and he declared that "the disadvantage of the use of the alternative plan for methods of cost finding is that it would call for a compilation of a large amount of data which would be useful only in a relatively small number of cases or a relatively few times during the year" (page 242).

An Expensive Plan

Continuing, the brief summarizes the testimony of F. J. Fell, Jr., then comptroller (now vice-president) of the Pennsylvania. Mr. Fell's testimony listed numerically 17 objections to the alternative plan, which were reported in the *Railway Age* of August 31, 1929, page 558. Among Mr. Fell's objections was the opinion that the plan could not be applied to the railroad industry, "for the reason that it is replete with both arbitrary and undefined bases for expense allocations." He said also that the test of the plan "refers to the necessity of manufacturing data but the plan makes no provision whatever to cover this subsidiary activity." The plan, he believed, would provide for over 3,000 accounts and would prove very expensive to the railroads.

The testimony of F. W. Sweeney, comptroller of the Northern Pacific, is next reviewed. Mr. Sweeney testified that the Northern Pacific had drafted "a general cost accounting scheme fully as efficient as that now before us, and has rejected it because after mature consideration it could not be shown that the results would justify the additional expense." He said further that the alternative plan makes no provision for l.c.l. freight and apparently that revenue derived from l.c.l. shipments would have to be distributed by commodities. Further he testified:

As one reads these statements for the first time he is tempted to believe that once understood the effect of the alternative plan would be to reveal the cost of hauling particular commodities between given points for comparison with earnings on the same commodities between the same points.

However, even Mr. Roberts' enthusiasm stops short of that point, but he does allege without qualification that the plan will develop "the cost of packing house products, for instance, as against the cost of products of mines." In this he very nearly approaches a definite statement. What it really accomplishes, as I dimly see it, is that an erroneous revenue figure of packing house products can be compared with a cost built up by the use of pyramided averages, producing a figure that is precisely the same for packing house products as for all other business in refrigerators, and with the slight difference in car repairs, the same as for coal or any other commodity (pages 1908, 1909).

The so-called cost accounting plan submitted by L. R. Bitney, statistician of the Minnesota Railroad and Warehouse Commission, is next reviewed. "The Bitney plan," it is said, "is an effort towards having railroad accounting and statistics by, or for, states." Three railroad witnesses testified regarding the Bitney plan and their opinions were, in the main, unfavorable. Among the criticisms was that of A. L. Conrad, assistant general auditor of the Atchison, Topeka & Santa Fe, who stated that his conclusions regarding this plan "might be concisely stated by pointing out that these statistics are expensive to compile, without compensating return to the carriers. The lack of utility in the proposed statistics cannot be ignored. Public interest would not be served by creating new statistics that would be misleading or cause confusion, create misunderstanding, or that would be inaccurate or misrepresentative, and without comparative value. The proposed statistics would not disclose costs nor aid in determining costs because many of these statistics are not supplemental to the accounting" (page 2295).

V. P. Turnburke, general auditor of the Great Northern, gave his opinion that the cost finally arrived at under the Bitney plan would be "20 per cent based upon actualities and 80 per cent upon apportionments" made on a basis "which was admittedly wrong."

The brief then proceeds to review the testimony of witnesses for the Taylor Society. J. H. Williams, for this society, asserted that continuous cost accounting systems intended to produce actual costs "are an absurdity." It was suggested that the railroads should use the so-called jobbing cost method for their shops. The brief points out that "the description of the jobbing system as contained in the record will be generally recognized as the shop order system used by the railroads." The brief comments on a suggestion that for purposes other than the shops the railroad should use the so-called continuous process cost method with the statement that, as described in the record, "the continuous process cost method is what the railroads are now, and for some time, have been doing, namely, controlling expenses through performance with related statistics, such expenses later carried into primary accounts."

J. J. Ekin, comptroller, Baltimore & Ohio, quoted C. A. Williams, comptroller of the American Safety Razor Corporation, in part as follows:

The idea of controlling business through accounts can be given exaggerated importance. Accounting is, after all, simply an aid to management, and can never be anything other than that. The whole accounting structure should be built on the design of simplicity to give the business the aid that it can use.

The brief summarizes the testimony of Dr. J. H. Parmelee, director, Bureau of Railway Economics, on the subject of cost accounting practices, where found on the railways of Great Britain, France, Belgium, Australia and Germany, and reprints a number of exhibits which Dr. Parmelee presented in this case, together with a lengthy one summarizing the history of cost finding on the American railroads.

Testimony and recommendations regarding the so-called "Oklahoma Formula" for determining costs is next reviewed and the following opinion is expressed:

The intricacies and technicalities of the proposed formula being more or less impracticable and tending to retard the compilation of the data; the accuracy of results under the formula being subject to challenge; the proposed formula not being such as to justify the expense of its application for developing local terminal costs at any terminal; the expense of general appli-

cation being altogether prohibitive—no need or occasion appears, from the railroad viewpoint, for discussion or consideration of the desirability of prescribing such a formula for general and uniform application.

The brief assures the Commission that the Railway Accounting Officers stand ready to co-operate in "every possible and practicable way" if the Commission desires to conduct a further research into cost accounting. It expresses the opinion, however, that the creation of a separate committee, as suggested in Commissioner Eastman's proposed report, "would appear to be a futile and unnecessary act." It points out that, should the Commission desire to make such a study, it "already has ample facilities and opportunities, and already has its staff qualified and able, to make such study and research." The brief expresses the opinion that the proposal of Witness Edward Wray with reference to material classification "was not accounting but was an effort to have the Interstate Commerce Commission prescribe a statistical compilation intended for managerial use, and in no way related to public regulation." The classification of material the brief says, "is a managerial function that in no way affects the accounting by the railroads."

The presentation of the Railway Accounting Officers Association in the hearing, it is stated, was confined to its recommendations with reference to the proposed revised accounting classification prepared by the commission's Bureau of Accounts.

The attitude of accounting officers was said to be, "that the accounting classifications should be simple, not complex; should be contracted, rather than expanded; should follow and portray practical railroading, not be based on the theoretical or impractical; and that economy, directness and dependability of accounting results should be controlling and impelling."

The testimony of J. J. Ekin, comptroller of the Baltimore & Ohio, was next reviewed. Mr. Ekin testified that in 1906, when Congress imposed upon the Commission the duty of prescribing uniform accounting, the Commission was "besieged by outside accountants, admittedly expert, and so-called expert," but that the Commission "decided to utilize the services of its own officers and employees, together with the co-operation of the experienced railway accounting officers."

The Railways' Concrete Recommendations

The brief reviews the recommendations of the railroads that investment in transportation property be limited to three kinds viz., road, equipment and investment suspense, and that the 32 primary accounts provided by the tentative revised classification of the Bureau of Accounts be eliminated. Commissioner Eastman's proposed reports stated that the present accounting practice had been in effect on certain railroads for long periods and the brief raises the question as to whether this situation "is regarded by the Commission as controlling." The brief holds that the distribution of investment charges among the component parts of the project under the present or proposed bases, is not productive of valuable or indispensable accounting information and that there is objection to it because such accounting "is of no significance and may be misinforming to stockholders, bondholders or the public generally." The brief says further that this proposal would bring the accounting regulation "into line with the requirements of valuation work," a "clear need" for which was stated in the proposed report to exist.

In the interest of simplification in accounting, the brief maintains the attitude of the railroad witnesses that the minimum adjustment in the investment account should be raised from $100 to $200. The account, Transportation For Investment—Cr., it is contended, should be eliminated "in the interest of proper and direct accounting, without undue refinement." The brief advocates, also, the elimination of mandatory requirements in the tentative revision for reporting plans of accruing revenues, as it does that "receipts from refrigeration and heating services are not revenues, and should not be stated as such," since no revenue is involved for the carriers over and above their expense in providing such service. It is urged that "the distinction between 'cost' and 'expense' should be constantly and clearly borne in mind unless the Commission officially recognizes those terms to be synonyms."

The brief supports the accounting officers' proposal for the establishment of primary accounts in operating expenses for "work train service," "shop expenses," and "material store expenses." The change is urged for the purpose of simplification and reduction in clerical labor and in order to make the totals of such expenses available to responsible officers, eliminating "the practice of charging expenses supervised by one department to other departments having no supervision thereover."

Attention is called to an error in the proposed report, wherein it is stated that this recommendation contemplated separate primary accounts for "material store expenses" and "stationery store expenses." It was stated that only one account "material store expenses," was desired.

The brief continues:

> If it be a fact that "these expenses do not belong to any one general group," and, therefore, should be apportioned to the accounts or departments benefited, then by the same logic and the same reasoning, all, or substantially all, of the expenses incurred by the carrier should be charged to conducting transportation. In other words, such a theory, carried to its logical and ultimate conclusion, would eliminate all maintenance of way expenses, all maintenance of equipment expenses, etc.

The proposed report makes no recommendations regarding the proposal that yard enginehouse expense and train enginehouse expenses be consolidated, holding that "this is a matter bearing on the subject of cost accounting and may properly be given consideration in connection with the proposed further research into that subject." The brief contends that, in the record, there is substantial agreement that "cost accounting could not be amalgamated with the accounting classifications, and that "such being the case any so-called cost accounting features should be eliminated, and the accounting classifications made to be what they purport to be, namely, financial accounting."

Commissioner Eastman's proposed report disapproved the railroad proposal for a new general group of operating expense account called "Miscellaneous." The proposed new group would include valuation expenses, pension and relief expenses, casualties, and material and stationery store expenses. The Commissioner stated that there was "no sufficient reason for making this change, pending a possible general rearrangement of accounts which may result from the further research into the cost accounting question."

The brief states that it has already pointed out that cost accounting "cannot properly have any place in" the consideration of financial accounting, and maintains that the proposed new grouping should be approved.

The brief characterizes the proposed report as "a constructive document" but claims it weak on "so-called cost accounting" which it attributes to "a tendency, indubitably unintentional, to emphasize the purely theoretical viewpoint." Since the proceeding is administrative, involving no litigation, no separate listing of exceptions is given, other than those in the brief proper.

George Hannauer Dies Suddenly

B. & M. president was authority on terminal operations and co-inventor of car retarder—Perkins becomes acting president

GEORGE HANNAUER, president of the Boston & Maine since January 1, 1927, died on November 2 at New Haven, Conn., following a heart attack suffered while he was attending the Yale-Dartmouth football game as the guest of John J. Pelley, president of the New York, New Haven & Hartford.

Thomas Nelson Perkins, chairman of the executive committee of the Boston & Maine was elected acting president at a meeting of the executive committee held on November 5 after the funeral of President Hannauer. In announcing Mr. Perkins' election, the executive committee said: "Mr. Perkins has consented to serve as acting president to meet the situation involved in the death of President Hannauer. It is desired that the policies so wisely developed by Mr. Hannauer shall be carried out, and that the several projects for further improvement in the railroad's service and facilities now under way shall be pressed to completion; and to this end Mr. Perkins has agreed to lend his services. The railroad has lost a president of extraordinary powers of direction and accomplishment, but he left an able organization which will work under the acting president in carrying out these aims."

George Hannauer

Mr. Perkins has been a member of the board of directors and executive committee of the Boston & Maine since 1924, and was elected chairman of the executive committee on March 7, 1928, to succeed Homer Loring.

Mr. Hannauer was widely known in railway circles not only because of his work in connection with the financial and physical rehabilitation of the Boston & Maine, but also as one of the country's leading authorities on railway terminal operation and as co-inventor of the automatic car retarder.

It was generally conceded that Mr. Hannauer's preeminence as a terminal executive prompted the directors of the Boston & Maine to select him as head of that property at a time when its terminal problems were most acute and there was pertinent need for reorganization and unification of these facilities. He had previously spent his entire career in the service of terminal railroads, first at St. Louis and then in the Chicago district. Because of this experience he had frequently been called upon to make special studies of terminal operating problems and, in fact, was retained to make such a study for the Boston & Maine in the spring of 1926—a short while before he was selected to direct the consummation of plans embodied in his recommendations.

While the Boston & Maine is not strictly a terminal property it did, nevertheless, have an extremely complicated terminal problem. This resulted from several factors, such as the fact that it serves a thickly settled area with a large proportion of short haul tonnage. Similarly a large share of its traffic terminates in its own territory. Most important, however, the Boston & Maine is a consolidation of a number of formerly independent roads, each of which had its independent terminals at Boston. Unified operation of the Boston & Maine's passenger terminals at Boston was effected when the consolidation took place but there had never been a satisfactory merger of the freight terminal operations of the several constituent railway properties. An elaborate unification plan was announced shortly before Mr. Hannauer's election to the presidency. It thus became one of his most important executive tasks to carry out this unification plan and to supervise the expenditure of money required to put it into effect.

As was stated at the outset, Mr. Hannauer assumed the B. & M. presidency on January 1, 1927. He succeeded in that position James H. Hustis, who resigned in April, 1926. During the interval from April to December 31, 1926, Homer Loring, chairman of the board, guided the road's affairs.

Mr. Hannauer immediately attacked the major terminal problem at Boston and new freight facilities constructed at this point during the past two years comprise a large modern car retarder yard at East Cambridge, Mass., to facilitate and centralize the heavy Boston classification work, a freight house, a storage warehouse, a bulk delivery yard and automobile unloading facilities, with adequate tracks, platforms and drive-

ways. The East Cambridge yard was opened on July 5, 1928 and was described in the *Railway Age* of July 7, 1928. Another major Boston improvement effected during the Hannauer regime is the new North Station, formally dedicated on November 14, 1928, and described in the *Railway Age* of August 25, 1928.

Meanwhile the B. & M. yard at Mechanicville, N. Y., had been completely rebuilt and converted into a retarder yard, incorporating all of the latest developments in retarder yard design. This was done, as described in the *Railway Age* of February 4, 1928, and the new yard was opened for service on January 4, 1928. But while the East Cambridge and Mechanicville yards are the outstanding improvements, all yards on the system have been studied and the yard plan placed on the basis of the greatest good for the system as a whole.

Mr. Hannauer also turned his attention to facilities other than terminals so that in fact it might be said in summary that within the past three years, the B. & M. has been practically rebuilt as to terminals, roadway, power and bridges, $43,000,000 having been spent for additions and betterments in 1926, 1927 and 1928. At the same time the operating methods have also been "rebuilt" to obtain the maximum utilization of these facilities. This reorganization of the B. & M. operating methods was described in detail in two recent *Railway Age* articles, one appearing in the issue of July 27 and the second in the issue of August 10. An idea of the success which has accompanied the development of this comprehensive program under the direction of Mr. Hannauer may be gleaned from a study of comparative statistics of financial results and physical performance.

In 1926 gross revenues were $81,625,376 and net railway operating income was $12,841,103. The gross revenues of 1927 fell to $77,848,374 but expenses were nevertheless held in check so that the decline in net railway operating income was $400,000 less than the drop in gross. The 1928 gross revenues fell away $1,224,136 from the 1927 figure. By this time, however, the Hannauer program was well under way and this decline in revenue was accompanied by a $4,406,178 drop in expenses to bring the net railway operating income for 1928 to $12,802,969, an increase of $3,302,197 over the corresponding 1927 figure. The operating ratio fell from 79.43 in 1927 to 74.95 in 1928.

Statistics of operating performance are equally impressive. Gross ton-miles per train-hour increased from 14,159 in 1926 to 18,534 in 1928; gross tons per train rose respectively from 1,334 to 1,570; train-miles per train-hour from 10.6 to 11.8; and car miles per car day from 21.4 to 26.3. A similar trend is indicated in recently published statistics for August, 1929. With but an increase of 2,341 train miles and an actual decrease of 16,812 locomotive miles the B. & M. during August, 1929, produced 21,560,000 more gross ton-miles, which yielded 2,004,000 more net ton-miles than in August, 1928. Furthermore gross ton-miles per train-hour were 20,311 in August, 1929, as compared with a figure of 18,731 for the corresponding 1928 month; gross tons per train were respectively 1,683 and 1,619; net tons per train 661 and 653 and net ton-miles per car day 388 and 370. At the same time pounds of coal per 1,000 gross ton-miles fell from an August, 1928, figure of 108 to 106 in August, 1929. Finally the Boston & Maine, which had been one of the railway pioneers in motor transport has, under Mr. Hannauer's direction, expanded its motor coach and motor truck activities until it is now one of the country's largest railway operators of highway passenger and freight services.

It will thus be seen that Mr. Hannauer's death comes at a time when the Boston & Maine is rapidly coming into the enjoyment of increasing benefits resulting from his keen insight into its problems, his masterful solution thereof and his skillful direction of the property to a successful consummation of one of the most comprehensive of recent railway rehabilitation programs.

George Hannauer was born on December 19, 1872 at St. Louis, Mo. He entered railway service on September 24, 1890, with the Terminal Railroad Association of St. Louis. From March 1, 1903, to April 8, 1907, he was superintendent of the Wiggins Ferry Company. He then became superintendent of the Indiana Harbor Belt, was on January 1, 1911, promoted to the position of general superintendent and on July 1, 1912, to general manager. Following the returns of the railroads to private control on March 1, 1920, he was elected also vice-president. In 1922 he gave up his duties as general manager but retained those of vice-president. He remained in this latter position until his election to the Boston & Maine presidency.

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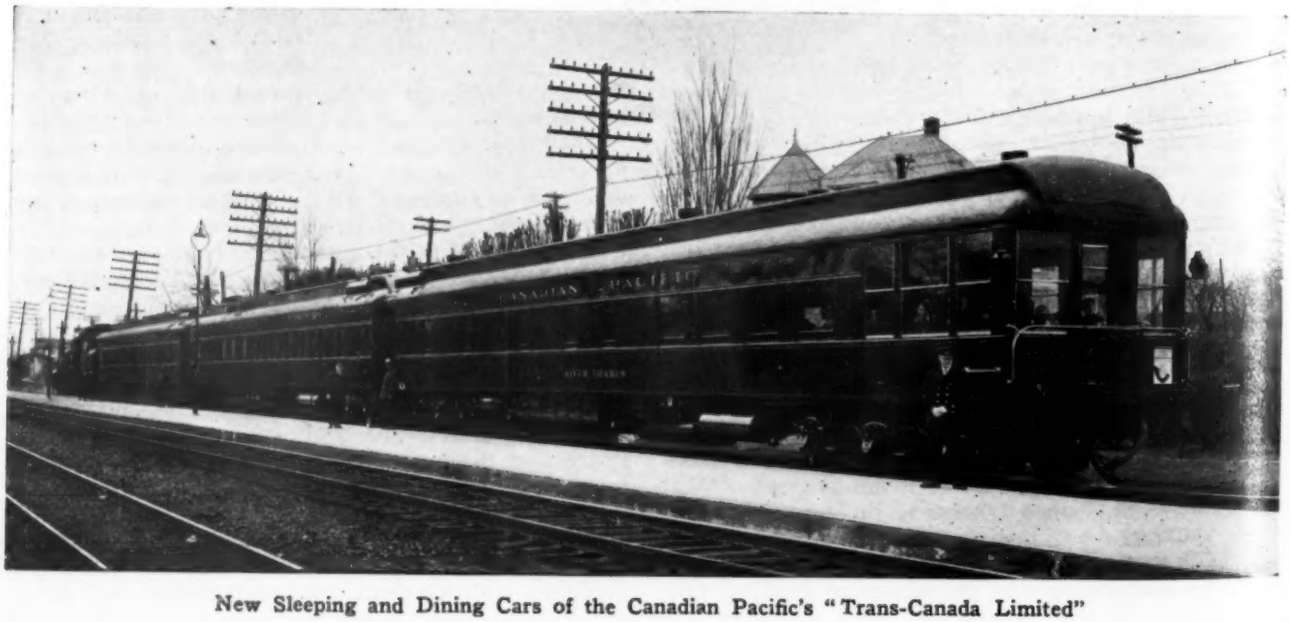
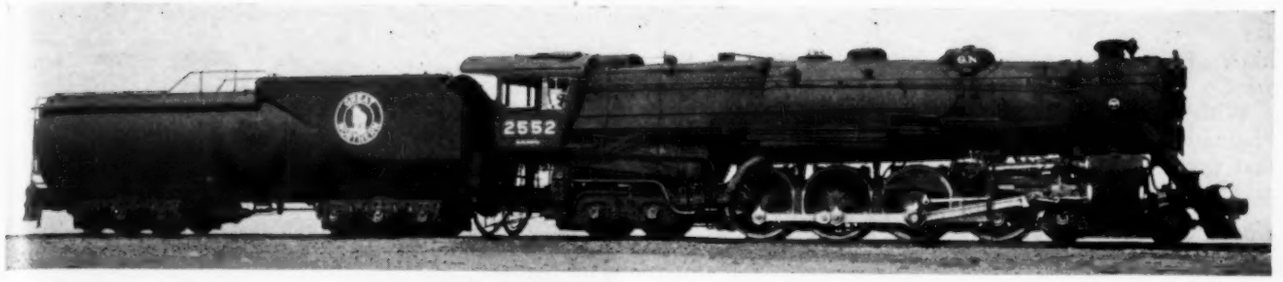


New Sleeping and Dining Cars of the Canadian Pacific's "Trans-Canada Limited"



Great Northern 4-8-4 Type Locomotive Built by the Baldwin Locomotive Works

Great Northern Buys Six 4-8-4 Type Passenger Locomotives

Built by Baldwin for operation over mountain territory between Havre, Mont., and Whitefish

SIX 4-8-4 type locomotives were recently placed in passenger service by the Great Northern between Havre, Mont., and Whitefish, with the principal objective of meeting the requirements of reduced scheduled time of its through passenger trains. These locomotives, which were built by the Baldwin Locomotive Works, develop a tractive force of 67,000 lb. They have 28-in. by 30-in. cylinders, and 73-in. driving wheels. The boilers operate at a pressure of 250 lb.

The total weight of one of these locomotives is 472,120 lb., of which 273,700 lb. is carried on the drivers, 88,820 lb. is carried on the engine truck, and 109,600 lb. on the trailer truck. The factor of adhesion is 4.08. The tender is of unusually large size, having a capacity for 22,000 gal. of water and 5,800 gal. of fuel oil.

Locomotives Capable of Hauling 14-Car Trains Over 1.8 Per Cent Ruling Grade

The steepest grades on the Great Northern are between Havre and Whitefish. In this territory, there is a ruling grade of one per cent westbound and 1.8 per cent eastbound. The latter extends for a distance of about 14 miles. It was decided to shorten the schedule time of such trains as the Empire Builder, operating between Chicago and Seattle and Portland, by approximately seven hours. This train now leaves Chicago at 9:00 p.m. Central standard time, and arrives at Seattle the third morning following at 10:00 a.m. Pacific time. Returning, the train leaving Seattle at 6:00 p.m., arrives at Chicago at 9:15 a.m. the third morning following. The total running time of the Empire Builder from Chicago to Seattle is 51 hr. 30 min. The road is practically up-grade the entire distance going west from Minneapolis, Minn., to Summit, Mont. Going east, upgrades are encountered practically the entire distance from Snohomish, Wash., to Summit. The latter station, which is 5,213 ft. above sea level, and the highest point on the system is 188 miles west of Havre and 68 miles east of Whitefish, making a total of 256 miles over which these locomotives are operated. The scheduled running time for the Empire Builder between Havre and Whitefish is 8 hr. 5 min. There are four scheduled

Table of Dimensions, Weights, and Proportions of the Great Northern (4-8-4) Type Locomotive

Railroad	Great Northern
Builder	Baldwin Locomotive Works
Type of locomotive	4-8-4
Service	Passenger
Cylinders, diameter and stroke	28 in. by 30 in.
Valve gear, type	Walschaert
Valves, piston type, size	14 in.
Weights in working order:	
On drivers	273,700 lb.
On front truck	88,820 lb.
On trailing truck	109,600 lb.
Total engine	472,120 lb.
Tender	375,780 lb.
Total engine and tender	847,900 lb.
Wheel bases:	
Driving	19 ft.
Rigid	12 ft. 8 in.
Total engine	45 ft. 6 in.
Total engine and tender	94 ft. 10¼ in.
Wheels, diameter, outside tires:	
Driving	73 in.
Front truck	36 in.
Trailing truck	45 in.
Journals, diameter and length:	
Driving, main	13 in. by 14 in.
Driving, others	11½ in. by 14 in.
Front truck	7½ in. by 14 in.
Trailing truck, front	9 in. by 13 in.
Trailing truck, rear	9 in. by 14 in.
Boiler:	
Type	Belpaire
Steam pressure	250 lb.
Fuel, kind	Oil
Diameter, first ring, inside	88 in.
Firebox, length and width	144 in. by 102 in.
Combustion chamber, length	44¼ in.
Tubes, number and diameter	61—2¼ in.
Flues, number and diameter	210—3½ in.
Length over tube sheets	22 ft.
Grate area	102 sq. ft.
Heating surfaces:	
Firebox	296 sq. ft.
Combustion chamber	105 sq. ft.
Tubes and flues	5,004 sq. ft.
Total evaporative	5,405 sq. ft.
Superheating	2,444 sq. ft.
Combined evaporative and superheating	7,849 sq. ft.
Tender:	
Water capacity	22,000 gal.
Fuel capacity	5,800 gal.
Wheels, diameter, outside tires	33 in.
Journals, diameter and length	6½ in. by 12 in.
Maximum rated tractive force	67,000 lb.
Weight proportions:	
Weight on drivers ÷ total weight engine, per cent	58
Weight on drivers ÷ tractive force	4.08
Total weight engine ÷ comb. heating surface	60.25
Boiler proportions:	
Tractive force ÷ comb. heating surface	8.56
Tractive force × diam. drivers ÷ comb. heating surface	624.00
Firebox heating surface, per cent of evap. heat. surface	7.42
Comb. heat. surface ÷ grate area	76.80

stops to be made on the run between these two stations.

With the new train schedule and the long, steep grades it was found necessary to purchase locomotives that would haul trains of 14 coaches over this district, eastbound, without a helper.

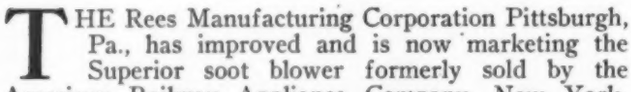
Locomotives Develop 67,000 lb. Tractive Force and Have 73-in. Drivers

The principal dimensions, weights and proportions of the six new 4-8-4 type locomotives are given in the table. They are designed to traverse 16-deg. curves. Each locomotive is equipped with a type E superheater, Elesco exhaust steam injector, Ragonnet power reverse gear, and Von Boden oil burner. The firebox and tender are arranged for the future application of stokers, in case it should become necessary to change from oil to coal.

The crank pins are heat-treated, and the main crank pins are hollow-bored. The main driving wheels are cross-balanced. Steam distribution is effected by means of a Walschaert valve gear, with the eccentric cranks set to increase the lead from 3/32 in. in full gear forward, to ¼ in. in mid-gear.

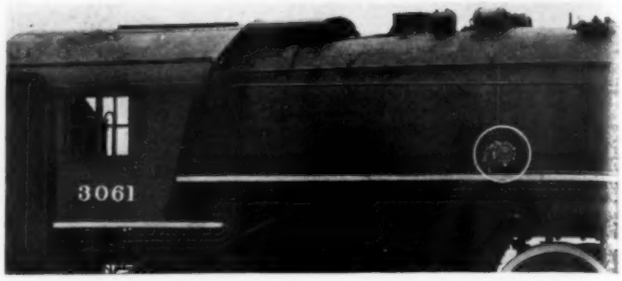
Improved Locomotive Automatic Soot Blower

THE Rees Manufacturing Corporation Pittsburgh, Pa., has improved and is now marketing the Superior soot blower formerly sold by the American Railway Appliance Company, New York. It is designed to maintain the flue sheet and combustion chamber of a locomotive free from honeycomb, soot and cinders under all conditions that may be encountered in modern locomotive operation. A description of this blower appeared in the May 19, 1923, issue of the *Railway Age*, page 1215, and a description of a number



Drawing Showing the Application and Operation of the Superior Soot Blower

of improvements which were made to the blower was published in the *Railway Age* Daily Edition, June 14, 1926, page 1783. This blower is designed with the object of eliminating cleaning at terminals and to prevent the accumulation of ash and soot on the flue sheet and combustion chamber throughout the longest run. It is claimed by the manufacturers of this appliance that its use will insure full effectiveness of the fire-heating surfaces, which means better steaming on the part of the locomotive; elimination of engine failures due to dirty and plugged flues; increased boiler efficiency and increased fuel economy; the elimination of the work of dumping fires at terminals in order to clean the combustion chamber and flue sheet, and the elimination of



How the Blower Appears When Applied to the Right Side of a Locomotive

the work of removing arch brick for cleaning and inspection of flues and flue sheet.

In order to secure the best results with the Superior soot blower, it should be used at least three minutes every 100 miles in passenger service and for the same time every three or four hours in freight service. The equipment is installed so that its operation is controlled entirely by the fireman through ordinary steam valves which admit steam to the blowers. The installation and operation of the Superior soot blower is shown in one of the illustrations. A fractional part of the steam admitted to the system operates a small turbine which oscillates the nozzles. The balance of the steam passes through the oscillating nozzles and sweeps the entire surfaces of the flue heat. Two blowers are used on each locomotive, one on each side of the firebox or combustion chamber, and are so adjusted that each blower covers 60 per cent of the flue sheet surface as well as the combustion chamber. Both blowers are located approximately 36 in. from the flue sheet.

Aside from the fact that the fireman must turn the valves in order to place the soot blower in operation, it is entirely automatic. The blower is entirely enclosed, which eliminates the possibility of steam leaks which might obscure the engineman's vision. The nozzles are made of special heat-resisting metal and are also protected by a shield. The body casting, which is fastened to the side sheet by four studs, houses a small turbine and driving mechanism which oscillates the nozzle. The nozzle extends through a tube in the water leg into the firebox, as shown in the phantom drawing. The tubes are cut from an arch tube. Steam from the turret is piped to the blower through a separate control valve for each blower. The control valves are located in the cab in a position convenient to the fireman. When steam is admitted to the blower the turbine oscillates the nozzle six to eight times per minute, sweeping the entire length of the flue sheet.

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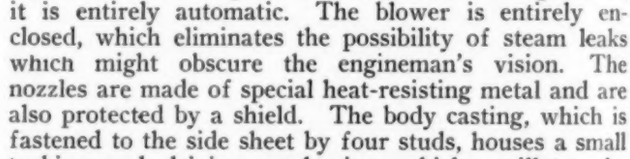

On the Boston & Maine at Mechanicville, N. Y.

What the Railway Man Expects from Advertising*

Ample space, informative copy, service illustrations and accuracy of drawings and statements give him "intelligent assistance"

By Carl F. Stoltz

Signal Engineer, Cleveland, Cincinnati, Chicago & St. Louis

THE general answer to the question of what a railroad engineer expects from industrial advertising would seem to be that he expects what might be expected from any advertising, an opportunity to buy advantageously. Of course, the primary purpose of an advertisement is to increase sales and make a profit for the advertiser, but it also contributes to the economic advantage of the purchaser in that it enables him, and educates him, to buy more intelligently. The engineer welcomes every such assistance the advertiser can offer. New devices are being offered constantly for use by the railroads and other industries and it is partially if not wholly through the medium of industrial advertising that the engineer keeps himself acquainted with what is available for his use.

The engineer's attitude toward advertising must differ somewhat from that of the general public. He personally neither owns nor pays for that which he purchases, yet upon his judgment in purchases largely depends his success. He should not resist the influence of advertising appeal, but should give it careful analysis. We hear a great deal about sales resistance; that sales resistance which closes the eyes and ears and answers, "No," should have no place in the policy of the engineer. The sales analysis that withholds the answer until all factors have been carefully weighed is the method that commends itself to the engineer.

From a practical standpoint, there are a few things that might be suggested. The railroad engineer is a busy man, particularly so when in his office. He is going to decide by a glance at the page whether or not your advertisement interests him. He must be convinced by the illustration, or by what is presented in the more prominent type, that it will be worth the time taken to read it.

My first suggestion concerns the size of the advertisement. When we look over the advertising pages of trade papers, our attention is naturally attracted by the advertisements which use the largest amount of space because they are more readily seen. I believe that there are many articles of merit that escape the attention of the busy purchaser by reason of the obscurity of the advertisement's position. It is appreciated that more space costs more money, but a large investment with larger returns ought to be more profitable than a small investment with smaller returns. Then too, the glance appeal, that which is told by the illustration and the big type, must convey to the reader, just as directly and intelligently as possible, what the advertiser can do for him. Then he will decide whether or not to read your whole story.

Carl F. Stoltz

Perhaps to the advertising expert this sounds as though I were reviewing the ABC's of his art, but if I am, some advertisers have not yet learned their alphabet. For example, in a recent issue of a technical magazine, a half-page advertisement is headed by the name of the company in large type. Underneath is a long list of electrical appliances, some of which are very good and at one time were leaders in their line. All are in very small type, however. On another page a competing company displays an attractive picture of a recently developed appliance with headlines telling of its performance. The first mentioned advertiser sells the same appliance, but the busy reader would never find it out. Another advertisement shows an appliance for attachment to the rail. The picture merely shows the appliance. A competing advertiser pictures a similar appliance, but in the illustration it is shown attached to the rail, so that the whole story of its use and application is told at a glance.

Illustrations are great time savers and if I were an advertiser I would give a great deal of study to the art of picturing my story. In preparing an illustration, great care should be taken to avoid foolish blunders which betray the advertiser's ignorance of the subject treated. I recall an advertisement which appeared a number of years ago which showed a train speeding away in the block and three signals indicating "clear." One would have been too many, but the artist apparently wanted to be liberal. Such illustrations betray an ignorance of railroad operation that destroys the whole appeal of the advertisement.

Then, too, after the story has been told as completely as possible in the heading and illustration, the rest of the copy should be brief. It is not necessary to cover every point that the engineer will cover in his investigation, if he is interested enough to go into the matter.

In addition to an advertisement structure that saves time, the engineer expects truthfulness and sincerity in the copy placed before him. Again I realize that this subject has probably been discussed since advertising began. The old time crook who used

* An address presented before the annual conference of the National Industrial Advertisers' Association at Cincinnati, Ohio, October 2.

advertising in a crudely dishonest way has been forced out of the picture, but inferences are still made that are not substantiated and some boastful lines of copy are not sincere. Advertising that is not taken seriously is about as damaging to the confidence enjoyed by all advertising as was the old fashioned fraudulent kind. I have no technical knowledge of advertising, but I believe that if I were an advertiser I would make it a rule never to print anything that my salesmen could not say to the prospective customer while face to face with him.

Attractiveness in Advertising

The engineer is appreciative also of attractiveness and beauty in advertisements. It is true that technical advertisers write copy for the eyes of men who are experts in their lines of work, who are spending someone else's money and may generally be presumed to be cold-blooded about it. It is not so easy to appeal to their personal desire and pride of possession, factors which aid the advertiser to the general public. Nevertheless, engineers are human beings and will react to the attractiveness of a well-constructed advertisement as readily as any other class of people. So far I have been rather critical, but that has not been because I find all the criticisms which have been mentioned in the trade papers I read. These cases are the exceptions that have presented themselves to me during many years and are not the rule.

Industrial advertising has made and is making a great contribution to the engineering field. The great strides made in increasing the efficiency of rail transportation during the past seven years have been due primarily to the discarding of obsolete appliances and practices and the adoption of adequate and efficient machinery which permits the use of efficient operating systems, essential to modern railroading. During 1928, five new records were established in increasing operating efficiency and although much of the credit is due to the alertness of the railroads themselves in taking advantage of every opportunity for improvement, a large share of the credit belongs to you gentlemen, who have placed before us advertisements of what has been and is now available for use in attaining our goal. Every advertisement we study and every salesman who calls are potential sources of additional information that may be applied to our problems. I am glad to have the opportunity to acknowledge my debt to the advertiser.

Signal Advertising

In my own field of signal engineering, progress has been rapid. New and more reliable devices are continually replacing those made obsolete by new inventions and experience. Devices are becoming more intricate and more and more technical knowledge is required. Our responsibility is great, for hundreds of millions of people annually trust their safety to the signal systems of the railroads. In railroad operation safety must always be first.

The engineer does not always use trade paper advertisements at the time they are published. He may not be in the market at that time, but all the advertisements are given the "once over." The magazines are held for reference and when information is desired concerning some particular device, back numbers of magazines are examined to locate advertisements that were noted when the publication was first received.

You have asked me what the railroad engineer expects from the advertiser, and my answer is: "Intelligent assistance."

Derailment Caused by Transverse Fissure

A PASSENGER train on the Missouri Pacific was derailed on June 25, 1928, at West Junction, Kan., resulting in the injury of 47 passengers and 4 employees. As a result of its investigation, the Bureau of Safety of the Interstate Commerce Commission has reported that "this accident was caused by a broken rail, the reason for the failure of the rail being due to the presence of transverse fissures." The rail in question was submitted to James E. Howard, engineer-physicist for the bureau, for examination, whose report, in part, follows:

The rail broke 14.85 ft. from its receiving end, at a large transverse fissure. Two other fissures, each of large size, were displayed at places beyond the initial break. These fissures had evidently reached the peripheral surface of the head of the rail prior to the time of the accident.

The broken rail was fragmented at the time of the accident beyond the locations of the several transverse fissures. In all, 10 fragments were detached. The circumstances attending the derailment lead to the belief that the rail was not broken until the train came upon it.

The nucleus of the fissure was on the gage side of the head. It had reached the periphery, admitted air and became darkened. Transverse fissures which reach the peripheral surface of the head commonly appear on the gage side, and at the fillet under the head. A thin layer of metal next below the running surface usually remains unbroken, while the metal of the outer half of the head also remains intact.

Rails which display transverse fissures not infrequently contain more than one. They display fissures in different stages of development. The present rail was no exception to this rule. Two fissures which had not reached the surface were subsequently discovered.

Cooling strains are set up in all structural shapes, under normal conditions of cooling in the open air, whether forged or rolled members. The first evidence of cooling strains in a rail is its change in shape after cambering. Rails tend to straighten themselves during cooling on the hot bed. One part of the cross section acts against the other, affecting the rail as a whole. Individual portions of the cross section likewise act upon each other. The effects of longitudinal strains are thus observed.

Still further, strains between the exterior and interior metal are introduced. The effects of the latter attract the most attention, since they often result in shrinkage cracks, and such cracks are held by some to be essential precursors in the display of transverse fissures. Shrinkage cracks occur in both the head and the base. No attention, however, has been given those of the base.

The impinging pressures of the wheels in service set up internal strains in the heads of rails. They are strains of compression immediately below the running surface, with reaction of tension in the interior of the head. The strains are both lengthwise and crosswise the rail. Crosswise strains tend to cause split heads; those which are lengthwise tend to cause transverse fissures. Each of these interior fractures, split heads, and transverse fissures, is of tension.

The crux of the rail problem is located in the upper part of the head of the rail. It results from the intense impinging pressures which are received there. Such pressures carried to extremity would destroy any known

grade of steel. The query is presented whether there now exists a safe margin in the endurance of rails against current wheel pressures. The display of thousands of transverse fissures is taken as evidence that a safe margin does not exist.

The problem is to make rails safe against present track conditions. They can not be called safe when numerous fractures of a particular type continue to occur. Transverse fissures should be investigated until it is established definitely whether there is a remedy for their display. Energetic efforts are demanded. No additional equipment is needed to inaugurate such an investigation, and it would be idle to say that enough material is not at hand.

Lines of Inquiry Open for Investigation

One line of inquiry which should be made immediately is that of the influence of shrinkage cracks in the central zone of the head. Would their suppression lengthen or shorten the lives of rails? The examination of a few of the many thousands of rails, which annually display transverse fissures, should assist in the solution of this question, and possibly yield a definite answer.

It is a matter of general comment that certain heats of steel display transverse fissures while others do not under similar conditions of service. Is there any peculiar structural, physical, or chemical reason which will account for such results? Abundant material is at hand for comparison of rails which fracture and those which do not. Compound transverse fissures, those which deflect from incipient horizontal split heads, have origins which are well known. Can seaminess, the cause of their formation, be eliminated?

Is there any foreign inclusion at the nucleus of a transverse fissure? Is there any peculiar structure at or in close proximity to the nucleus of a transverse fissure? Inquiries have already been made along these lines with negative results. Has anything been left out in those investigations which further study will reveal?

Through the efforts of E. A. Sperry, material may now be obtained, in which transverse fissures in different stages of development are definitely located. Such examples afford opportunity to ascertain what microconstituents are involved in the inception of a transverse fissure. What characteristics predominate in rails of greatest endurance against the display of transverse fissures is an open question.

In the investigation of shrinkage cracks, and their display after the steel is pickled in hot acid, steel which has been overstrained goes into solution more rapidly than understrained metal. This leads to the query whether all of the cracks subsequently found preexisted before pickling. Means should be adopted for differentiating between cracks due to shrinkage conditions and those which result from the cold rolling action of the wheels. Are cooling strains on the verge of rupture converted into open cracks by wheel loads?

In view of modifications in the composition of rail steel, the characteristics of medium manganese steel would be of interest. If any grade of steel is found to possess superior durability against the formation of transverse fissures, that steel should be given suitable study.

Two Distinct Problems

Suppression of the formation of transverse fissures is one problem. Their detection in their incipient or advanced stages is another problem quite apart from the first.

Since steel is fractured only by excess strain and since all rails in service are subjected to strains of magnitude, it would seem that the fundamental cause for the display of transverse fissures could not be eliminated. Steels differ, however, in their ability to endure strains; therefore, by selection, a grade of steel may be found best adapted to meet the requiremnts of track conditions. There is no hope for such a reduction in wheel loads that overstraining the metal at the top of the head of the rail will be avoided.

The real question then is what can be done to make travel safer under current track conditions, as against the display of transverse fissures. To this question, which affects the entire traveling public, the most serious attention should be given. A grave responsibility rests somewhere, present tendencies and results emphasizing this fact. A great step forward has been made recently in the physics of steel. What has heretofore been denied is now an open book. Means are available for detecting the presence of hidden fissures within the heads of rails. Track equipment for this purpose became available early in the year 1928.

If the matter was not so colossal it would appear that the detection of transverse fissures, and therefore immunity against unexpected fractures in the track, was a possibility. The magnitude of the problem is its appalling feature. Two outstanding matters of importance are presented for urgent action; concerted, active steps, on a scale commensurate with the magnitude and gravity of the subject, ascertaining definitely whether difficulties are insurmountable or not in the elimination of transverse fissures, and concurrently take adequate steps to remove the menace of transverse fissured rails from the track.

Fissure Brought to the Surface by Peening

An experiment was made upon the rail at the location of the larger fissure, by peening with a light hand hammer. The belief is entertained that internal strains set up in service by the impinging pressures of the wheels, are instrumental and basic in the formation of transverse fissures. The internal strains are the essential factors, the means employed for their introduction immaterial. Since internal strains may be set up by peening the surface of the head, it might be expected that peening would assist in the development of an interior fissure. Accordingly this experiment was made.

The rail was peened in the vicinity of the larger hidden fissure. After a number of hammer blows, the transverse fissure made its appearance at the surface of the head. Internal strains were thus introduced, extending the boundary of the internal fissure until the peripheral metal of the rail was reached.

The limited time and small number of hammer blows which accomplished this result are significant features. They suggest the probable rapid development of transverse fissures in the track.

In important engineering structures, limiting unit stresses are carefully prescribed. In tension the usual range is from 12,000 to 16,000 lb. per sq. in. In compression substantially the same limits prevail, but modified in the case of columns according to their ratio of slenderness. In long columns the permissible unit stress is lowered. Any engineering example outside of a track structure designed without regard to limiting fiber stresses is inconceivable. Rails stand alone without any definition of what the stresses in service shall be. The difficulties of the problem are recognized; nevertheless, there is no obstacle to giving the matter some consideration.

Important engineering structures should possess a suitable margin in safety. This is obtained by limitation

of the working stresses. In rails a serious condition is presented. Wheel loads of motive power and equipment each overstrain the metal in the upper part of the heads of all rails. Strictly, no rail is immune from fracture, after a period in the track. Theoretically and practically all rails are exposed to conditions which culminate in the destruction of the metal. Internal strains set up by the wheel loads are proof of this assertion. The results of measured strains in rails, which have been in service, carry with them the deduction that a definite known margin of safety does not exist in rails. There is no known steel which has properties which enable it to resist current wheel pressures without the introduction of internal strains.

Overstraining the running surface by means of wheel pressures necessarily introduces internal strains in two directions, lateral and longitudinal. The lateral component leads to mashed and split heads, the longitudinal component leads to the display of transverse fissures. It is clearly evident that there is no escape from the effects of these intense impinging pressures. As the crux of the rail problem they must be recognized and reckoned with. Since it is impossible to avoid these intense pressures, the practical question is what grade of steel will best endure them. That information must come from track records, from rails which have been exposed to the vicissitudes of service, intense impinging pressures, rapidly applied loads, vertical wave motions, and longitudinal vibrations. Loads are received along different elements of the rail heads according to the varying contours of the wheel treads.

Manufacturing Conditions

There are two features which attach to manufacturing conditions, namely, shrinkage cracks in the central core of the head and acicular longitudinal slag streaks or extended blow holes. Longitudinal streaks undoubtedly lead to the formation of compound transverse fissures, but further data are needed to demonstrate the influence of shrinkage cracks. These data, of course, must come from the examination of rails which have been in service.

Although repeated examinations have been made of the metal in the vicinity of transverse fissures, and no foreign inclusion of any kind discovered nor any peculiarity in composition or structure, nevertheless a more intensive study is desirable of these features. Fractures must have definite origins. What microconstituent is responsible for the inception of rupture? Internal strains are set up by heat or mechanical treatment, in treated and untreated steels. What relations do the microconstituents bear to the points of inception of fractures? A comprehensive study of the phenomena of rupture is required in the matter of transverse fissures.

Suggestive lines of inquiry are numerous, which direct efforts for prolonging the lives of rails against the formation of transverse fissures. The prevention of transverse fissures, if such is possible, or retardation of their display, is a matter of vital importance in respect to safety in travel. Efforts to meet such ends should not be held in abeyance. Eighteen years have elapsed since this insidious type of fracture was brought to general notice and yet no adequate, comprehensive research has been inaugurated toward the amelioration of conditions.

Facilities are at hand for the detection of transverse fissures in the laboratory and in the track. While the detection of transverse fissures, in their different stages of development, and their elimination or retardation of development are entirely different problems, nevertheless, the investigation of fissures is greatly aided by means of facilities whereby they are accurately located in the rails. This method indicates the exact spots at which research should be directed, and where the information sought is located before it has been destroyed. Never before have such favorable opportunities been presented for acquiring exact information upon the formation and development of this dangerous type of fracture. On account of the magnitude of the problem and the desirability of acquiring complete data from general sources, to embrace conditions as they are found in different parts of the country, a joint comprehensive inquiry is urgently demanded.

* * * *

Mile-Long Freight Train of Florida East Coast Leaving Bowden, Fla.

Electrical Section Holds Meeting

Body under new status, discusses sixteen reports on electrical subjects

THE first meeting of the Electrical Section, Division IV Engineering, American Railway Association, under its new status, was held in the board room of the Grand Central station, on Wednesday, October 30. Sixteen committees reported. There was little discussion, the time being given to the presentation of reports, to organization work and to the election of officers. About 40 representatives and members were present. The meeting was started at 10 a. m. and concluded at 12:30 p. m.

It was decided that the manual of the Electrical Section be printed in loose-leaf form, that the revised insulator specifications, prepared by Committee No. 9, and the revised incandescent lamp schedule, prepared by Committee No. 13, both be placed in it.

Inductive Co-ordination

The work of the Committee on Inductive Co-ordination concerns the satisfactory operation of paralleling power and communication circuits. Outlines of the work to be performed by the committee have been sent to the chairman of the Committee on Inductive Co-ordination of the Telegraph and Telephone Section of the A. R. A., so that the work of the two committees may be co-ordinated. Negotiations have been proceeding for some time looking toward the formulation of a joint general committee of the National Electric Light Association and the American Railway Association for the study of mutual problems of inductive co-ordination. Committees presenting the N. E. L. A. and the A. R. A. for this purpose have been appointed.

The problem of inductive co-ordination where railroad propulsion circuits are concerned, involves outside companies as well as the telephone and telegraph department of the railroad. It was determined by the committee that this problem can best be handled by co-operation between the railroad's engineers and the engineers of other companies or departments in the early stages of development of the plan. Such co-operative work results in advance planning and testing, and permits such changes as may be necessary to be made without interference with the operation of any of the facilities involved. A study of the inductive interference sets on the Wilmington and West Chester electrifications of the Pennsylvania Railroad, was carried out by the committee with the closest co-operation between the commercial telephone and telegraph companies, the electrical manufacturers and the railroad's telephone and telegraph, signal and electrical departments. Both of these electrifications operate at 11,000-volts, single-phase, and employ at present multiple-unit passenger trains exclusively. The Wilmington line is 27 miles long and the West Chester line is 25.6 miles long.

Some of the factors which tend to minimize inductive interference were determined to be as follows: Good insulation; elimination of hard spots in the trolley; double-end feed as distinguished from stub-end feed of power supply to the contact system; closely-spaced substations which improve voltage regulation and reduce losses; use of high-speed circuit breakers; thorough bonding of the rails; grounding the mid-points of the high potential side of the step-up transformers through a resistance of 330 ohms; placing communication circuits in underground conduit; use of a neutralizing or shielding wire strung on the communication pole line.

Arrangements have been set up and are in operation for a continued study of these situations.

Water Power

The report of the Committee on Water Power includes brief descriptions of the principal water power projects now being planned or in process of completion in the United States and Canada. The report states that during the year 1928 there was an increase in the capacity of water wheels in waterpower plants in the United States of 1,275,530 hp. and in Canada an increase of 550,000 hp., bringing the total of these countries up to 13,571,530 hp., and 5,328,000 hp., respectively. Attention was directed to the recently approved Rules of Practice in Formal Proceedings under the Federal Water Power Act and Procedure in Formal and Informal Proceedings, published by the Federal Water Power Commission.

The power committee was discharged and a power supply committee was appointed in its stead to study all forms of power generation, including water, steam and internal combustion power.

Electrolysis

The report states that studies of soil corrosion are being made in Oakland, Berkeley and Alameda, Cal., and Detroit, Mich., and that a report will be made when data are available. A study was also made of the literature concerning alternating current electrolyses, and extracts from the 1921 report of the American Committee on Electrolysis are included as information. These are as follows:

"If alternating currents or frequently reversing direct currents flow through the soil between the pipes or other underground metallic structures the metal removed during the half cycles when a pipe is anode may be in part replaced when it is cathode. Hence the total loss of metal on a given pipe may be less than is indicated by computing the loss on the basis of the positive part of the cycle only, and in the case of alternating current at commercial frequency, may be less than one per cent of such computed values.

"When the first alternating current railways were proposed, the question of possible electrolytic effects received special investigation. Considerable work was done upon a laboratory scale, in which it was established that alternating currents could produce corrosion on electrodes of the metals commonly used underground, such as lead and iron, but that the effects were very much less in magnitude than those produced by equivalent direct currents, usually less than one per cent and in most cases negligible."

During the coming year the committee will report on any measures taken to mitigate electrolysis in con-

nection with the direct current electrification systems now being installed by the Cleveland Union Terminal Railways and the Delaware, Lackawanna & Western.

Co-operation in Miscellaneous Regulations

No meetings of this committee have been held during the year but its members have acted as observers of statutes designed to regulate crossing of telephone, telegraph and electric power lines, one with the other and with railroads. The report also states that negotiations with the National Electric Light Association in connection with the preparation of a statement of principles and practices for power wire crossings over railroads with accompanying specifications, are progressing satisfactorily. The work of the committee will be continued in co-operation with the United States Bureau of Standards for the revision of the National Electrical Safety Code under the procedure of the American Standards Association for any part of the code that may be reopened, or in the specifications for supply lines crossing railroads; also, with representatives of the National Electric Light Association in concluding a general argument as to principles and practices and in the formulation of specifications covering power wire crossings at railroads to be made the standard of both associations.

Overhead Transmission Line and Catenary Construction

The function of this committee is to revise and to keep up-to-date the transmisison line and catenary specifications. No changes or additions are recommended for the former. Concerning catenary specifications, it is recommended that the ratio of dry flash-over of insulators to line voltage should vary for different atmospheric conditions and different classes of construction. Detailed specifications are included to show what is meant by different atmospheric conditions and classes of construction. A table is also given for dry insulator flash-over values for class A conditions.

Replies to a questionnaire sent to railroads having overhead catenary construction show that in general the railroads are using higher flash-over values than those calculated. It is therefore recommended that the calculated values be considered as the minimum for good practice. Consideration of other sections of the preliminary draft of the catenary specifications is being deferred until such time as the negotiations of the joint committee of the National Electric Light Association and the American Railway Association have been further advanced.

Economics of Railway Location

This committee is assigned the subject of collaborating with Committee 16, American Railway Engineering Association, on Economics of Railroad Location and Economics of Grade Revision as affected by the introduction of electric locomotives. The Electrical Section Committee does not initiate any studies and no report was rendered as Committee 16 has not submitted its report to the Electrical Section Committee.

Standardization of Insulating Tape

The work assigned to this committee was the study of insulating tape with special reference to varnished cambric. Considerable information and data have been collected during the year but the committee has been unable to obtain information sufficiently complete to be used as the basis of a set of specifications and reports progress.

Standardization of Insulators

The committee recommends that the divisions now included in the insulator specifications be brought into conformity with similar divisions in the American Institute of Electrical Engineers, insulator tests specifications. While this specification does not cover insulators made of Boro Silicate glass, it is considered that pin insulators of proper design made of this material are suitable for the above purposes.

Clearances for Third Rail and Overhead Working Conductors

Tables are presented by this committee indicating present-day practices on electrified railroads for third rail and overhead conductor clearance as of October 1, 1929. Numerous questions on reconciliation of various association clearance diagrams, as recommended by the different committees, have been discussed through correspondence by members during the year.

Protection of Oil Sidings

The report of the Committee on Protection of Oil Sidings from danger due to stray currents, indicates that the existing rules would be so modified as to provide for protection from danger due to static electricity and that a draft of the rule so modified would be submitted for consideration in 1930. In connection with the formulation of such an addition to the rules, an expression of opinion was obtained from a number of railroads and oil companies. From the information obtained it appeared that such protection is desirable. This conclusion was substantiated by a joint meeting of the Committee of the Petroleum Institute and the Electrical Section Committee. In deference to a request made by the Committee of the Petroleum Institute for an opportunity to present the matter at its December meeting the formulation of a definite rule was deferred for inclusion in the 1931 report of the Electrical Section Committee.

Specifications for Track and Third Rail Bonds

The Bonding Committee of the Electrical Section has held joint meetings with the American Electric Railway Engineering Association Committee on heavy electric traction and representatives of manufacturers. The two committees are working on tentative standards of stud terminal bonds with respect to dimensions of pin terminals, drift pins, taper punches, length and stranding. The discussions have brought out the possibility of reducing the number of standard types of bonds.

The committee has kept in touch with foreign practice and with experimental work in this country, with respect to compositions used in rail joints to replace bonds. The information obtained, however, has not been such as to indicate the practicability of the substitution of compositions for copper bonds.

Experiments have been completed by manufacturers, and the specific resistances of welding metals used in both have been determined. The unit resistances are so small, and the length of the path through which current flows through the weld is so short, that the resistance through the welded portion is negligible. The determination of proper area of weld is fixed by mechanical conditions and this feature will be consid-

ered by the committee in connection with next year's report.

Illumination

The report of the Committee on Illumination deals with incandescent lamp schedules, specifications for incandescent lamps and railroad yard flood lighting. A complete revised table of incandescent lamp standards is included. The committee recommends the adoption as an A. R. A. specification the United States government master specifications for large tungsten filament incandescent lamps. A brief description of yard lighting development was included together with a table including quantative data on some of the more recent and typical railroad yard floodlighting installations. The report is essentially the same as that presented by the Committee on Illumination of the Association of Railway Electrical Engineers and published in the October issue of Railway Electrical Engineer, but has been modified to meet the somewhat different requirements of the two Associations.

Design of Indoor and Outdoor Substations

The report of the Substation Committee concerns the selection and use of substation apparatus. The first part of the report is given over to description of protective devices used for rotary-converter, motor-generator and motor-arc rectifier substations. This is followed by a description of best practices in the design of substation buses. The report concludes with detailed recommendations concerning oil purifying for electric railway substations. The report states that circuit breaker oil should not be purified by centrifugal machines unless it is afterwards passed through a blotter filter press. By way of explanation, the report states that centrifuging action on oil containing carbon causes colloidal carbon to be formed and held in suspension in the oil. Such oil will test high immediately after centrifuging but the dielectric strength falls very rapidly.

The report states that the largest amount of oil to be handled in a substation at any one time is transformer oil, and that under normal operation transformer oil does not contain carbon, thus permitting the use of centrifugal machines. The report further states that the greatest cause of reduced dielectric strength in transformer oil is moisture, and, therefore, large quantities of blotter paper are consumed when presses are used for transformer oil with the result that the water makes the paper soft and causes it to puncture under the pressure applied. For these reasons, filter presses are recommended for circuit breaker oil and centrifuge machines for transformer oil.

High Tension Cables

The committee on High Tension Cables has presented a form of questionnaire for recording information relative to high tension cables. This is being sent to companies using cables at 25,000-volts and over in an effort to develop information concerning the trend of design.

Corrosion Resisting Materials

The committee on Corrosion Resisting Materials is now making accelerated corrosion tests of various materials suitable for messenger or catenary hardware. Invitations have been sent to a large number of manufacturers to submit samples for corrosion tests. These samples will be in one of the following forms: (A) Trolley wire 5 ft. long; (B) Messenger strand 5/8 in. outside diameter, 5 ft. long; (C) Round rolled or drawn rods, 1 in. diameter, 6 in. long; (D) round cast rods 1 in. in diameter and 6 in. long; (E) cast trolley clips; (F) one-half inch carriage bolts to fit trolley clips. These samples will be installed in a roundhouse smoke jack at New Haven on the New York, New Haven & Hartford, in the tunnel at Welch, W. Va., on the Norfolk & Western and on the Lamberts Point Coal Pier at Norfolk, Va., on the Norfolk & Western. The samples will be weighed before they are installed in these locations and the amount of corrosion will be reported as a percentage loss of weight for the length of time exposed. Several years will be required before conclusive results can be reported. A question was raised concerning the use of manufacturers corrosion data, but it is the belief of the committee that the railroad test data would be more valuable.

Election of Officers

The meeting was concluded by an announcement of the election of officers as follows: Chairman, S. Withington, electrical engineer New York, New Haven & Hartford; vice-chairman, J. V. B. Duer, electrical engineer, Pennsylvania Railroad.

Committee of Direction (terms to expire in 1932) W. M. Vandersluis, electrical engineer, Chicago Terminal Improvements, Illinois Central; J. H. Davis, chief engineer, electric traction, Baltimore & Ohio. (Terms to expire in 1931) D. J. Brumley, chief engineer, Chicago Terminal Improvements, Illinois Central; L. S. Wells electrical superintendent, Long Island. (Terms to expire 1930) H. M. Bassett, general office engineer, New York Central; G. I. Wright, engineer electric traction, Reading Company.

THE FEDERAL FARM BOARD has been asked by Representative Jones, of Texas, to join in a request to the Interstate Commerce Commission that the freight rates on wheat and cotton for export be reduced "in similar proportion to the reductions now allowed" on certain industrial commodities which he cited as receiving lower rates when intended for export than those accorded domestic shipments. Mr. Jones, who had previously introduced in the House a joint resolution to the same effect, said these "inequalities" should be corrected either by reducing the export rates on cotton and wheat or by doing away with "all the reductions on export industrial commodities, so that revenue would be increased to an extent which would permit the entire rate structure to be brought down."

* * *

B. & A. Local, Newton Centre, Mass.

William G. Lee, Former Trainmen's President, Dies

Brotherhood leader, noted for his independent and fearless action, succumbs to 12-year illness

WILLIAM G. Lee, who, until his defeat for re-election at the triennial convention in 1928, had served for 19 years as president of the Brotherhood of Railroad Trainmen, died at his home at Lakewood, Cleveland, Ohio, on November 2, after a 12-year fight against cancer. Following his defeat for re-election in June, 1928, Mr. Lee was elected general secretary-treasurer of the brotherhood, a position he held until he was granted a leave of absence on June 1, 1929.

Mr. Lee was known as the greatest individualist, and one of the ablest and fairest men, who ever led organized railroad labor. The alinement of the railroad trainmen and their action in any situation while he was their leader could always be depended upon to be the result of independent thinking on the part of the organization's officers and not merely of a desire to follow blindly the course of other labor unions.

William G. Lee

He became president of the trainmen on January 1, 1909 at a time when the affairs of the brotherhood were in serious condition. When he first became an officer, the country had been disturbed by labor difficulties resulting from the panic of 1893 and the efforts of the American Railway Union, which precipitated the railroad strikes of the early '90s, to disrupt the trainmen, and it is related that on his first trip into the west as a general brotherhood officer Mr. Lee traveled from Omaha to San Francisco without being able to hold a single meeting. When he took over the presidency, the brotherhood had about 100,000 members and a million dollars in funds, which he increased during his incumbency to 184,000 members and $10,000,000.

In his negotiations with railway managements Mr. Lee was known for his frankness, fairness and dependability. He had the greatest confidence in the effect of the personal acquaintance of men with each other and usually went to extreme lengths in order to avoid the necessity for a strike. His belief in that policy is best expressed in a portion of an address which he made before the Western Railway Club at Chicago in 1923:

"There have been times when the lines between railroad employers and employees have been very sharply drawn, when it has been necessary for both sides to express their disbelief in the fairness of the demands of the other, and to express a determination to fight it out rather than accept compromise of any sort. And yet when calmer counsel has succeeded intense feeling, usually we have managed to get together and adjust our affairs, if not satisfactorily to both sides, at least in a manner that has enabled us to get along peacefully and fairly well together.

"I have unlimited faith in the fairness of my fellowmen. We have made sacrifices to avoid the severance of relations with employers, and believe that by so doing we have contributed our full share toward stabilizing the transportation business, contributed our full share toward the most efficient railway service in the world, and, in general, contributed a wholesale influence toward a better understanding of the relations as they should exist between the employer and the employee."

Under Mr. Lee's leadership the trainmen favored the enactment of the automatic coupler and the power brake law, the Federal Liability law and the Adamson law, and were active in opposition to the continuance of the United States Railroad Labor Board through the repeal of a portion of the Transportation Act of 1920. Another passage in the same address sets forth Mr. Lee's idea of the necessity for stability in the conduct of a labor organization:

"The bulk of the organization is in accord with the enforcement of organization law, and it stands for no disobedience of its statutes or violation of its contracts. This is not popular among certain employees, who feel that expediency is the first law of organization progress. The brotherhood has been severely criticized, assailed

and misrepresented because it did exactly what its representatives in convention said it should do under such circumstances. The brotherhood in the future, as in the past, will obey every law, every statute, and fulfill every obligation according to its understanding."

The Switchmen's Strike

Perhaps the situation which most clearly brought out Mr. Lee's qualities as a leader occurred in the unauthorized switchmen's strike of 1920. Late in 1919, after the general committee of the trainmen had given him power to call a strike to enforce demands for higher wages, Mr. Lee conferred in Washington with Walker D. Hines, director general of railroads, and Samuel Gompers, president of the American Federation of Labor, the latter advising him to delay any drastic action.

Early in 1920 the impatience of the switchmen began to manifest itself, and in April switchmen on the Milwaukee at Chicago walked out in support of a grievance of one of their number. This group persuaded other Chicago switchmen to join them in a demand for a wage increase. While the strike spread to other terminal points, Mr. Lee and the brotherhood organization stuck to their original decision and denounced the strike as illegal and unauthorized. The striking members were disciplined, an action on the part of Mr. Lee which resulted in the expulsion of about 30,000 switchmen from the brotherhood, or about one-sixth of its membership. This action placed the organization, of which Mr. Lee was the head, in an enviable position in the public esteem.

Mr. Lee was born at La Prairie, Ill. on November 29, 1859, and after attending the public schools of Bowen, Ill., he entered railway service in 1879 as a brakeman on the Atchison, Topeka & Santa Fe at Emporia, Kan. Later he was transferred to the Raton-New Mexico division and in 1880 he was promoted to conductor, also serving as a trainman on the Missouri Pacific and the Wabash. For three and one-half years he acted as deputy registrar of deeds of Ford county, Kan., then returning to railroad service in 1888 as a conductor on the Union Pacific. He left railway service in 1895 to become first vice-grand master of the Trainmen, a position he held until his election as president in 1909.

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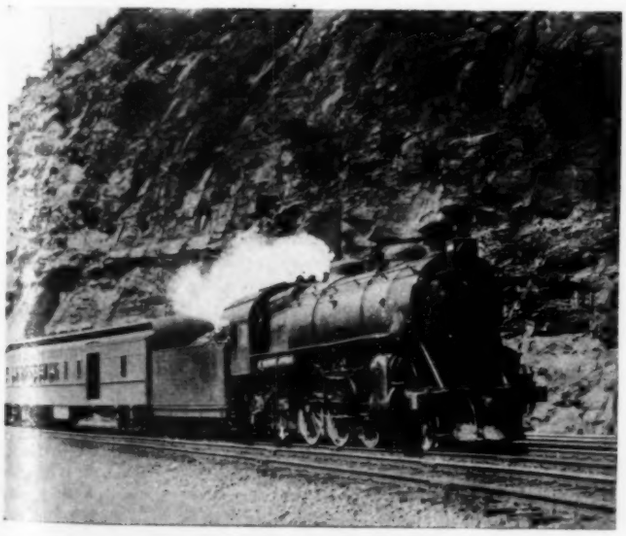


Eastbound on the Pennsylvania

Looking Backward

Fifty Years Ago

The Atlantic & Gulf [now part of the Atlantic Coast Line] was sold in Savannah, Ga., November 4, under a decree of foreclosure granted by the United States Circuit Court, and was bought for $300,000 by Henry B. Plant [who was later president of the Atlantic Coast Line]. The sale included the main line from Savannah to Bainbridge and several branches, 350 miles in all.—*Railroad Gazette,* November 7, 1879.

The bitter controversy over the Pacific Coast terminus of the Canadian Pacific appears to have been ended by the final selection of the Burrard Inlet at Port Moody on English bay instead of either Port Essington via the Peace River route or Bute Inlet near the north end of Vancouver Island. The six-year survey of the line required an expenditure of $3,137,000 and cost the lives of 34 engineers, of whom seven were burned in forest fires, 24 were drowned at river and lake crossings and 3 died from disease.—*Railway Age,* November 6, 1879.

The assistant to the president of the New York, Lake Erie & Western [now the Erie], who was on the witness stand before the Railroad Investigating Committee of the New York Assembly for eight days stated that it is perfectly legitimate to take into account the value of the service rendered by the carrier in fixing charges, which has been called "charging what the freight would bear." He also thought it proper in consideration of quantity and regularity of shipments to allow drawbacks which might amount to reductions of from 5 to 20 per cent of the regular rates.—*Railroad Gazette,* November 7, 1879.

Twenty-Five Years Ago

The Western Pacific, which is projected from Salt Lake City, Utah, to San Francisco, Cal., now has a surveying party in the field at Beckwith Pass, Cal., making the final location for the route over the Sierra Nevada mountains. *Railway Age,* November 11, 1904.

The average receipts per ton per mile for railways in the United States operating 204,668 miles of line in 1903 were 0.781 cents. The average receipts per freight train mile were $2.44 while the average haul per ton was 131.79 miles.—*Railway Age,* November 11, 1904.

The construction of a second Canadian transcontinental railway from the Atlantic to the Pacific, partly owned by the government, but wholly operated by the Grand Trunk Pacific was assured by a sweeping victory for the Liberal party, already in power, at the Parliamentary elections on November 3.—*Railway Age,* November 11, 1904.

Ten Years Ago

The Senate Committee on Interstate Commerce on Wednesday practically decided that it was impossible to pass comprehensive railroad legislation before the end of the year; it tentatively decided to substitute for the Cummins bill a brief resolution providing for the return of the roads, January 1, with temporary extension of the guarantee.—*Railway Age,* November 6, 1919.

The strike of bituminous coal miners went into effect on November 1, with the national headquarters of the United Mine Workers at Indianapolis, Ind., silenced by a court restraining order. The petition by the government charged that the union men were conspiring to limit the production of coal and to restrict the distribution of fuel. A reduction in railway service began on November 3 when the Delaware, Lackawanna & Western discontinued 18 suburban trains and the New York Central discontinued several trains in northern New York. Fuel Administrator Garfield revived the fuel preference lists which give the railroads prior claims to coal.—*Railway Review,* November 8, 1919.

Communications and Books

Engineers and Accounting

WASHINGTON, D. C.

TO THE EDITOR:

I have read with interest your editorials in the issues of September 14 and 21 on the subject of the proposed revised classifications of accounts for railroads.

It seems to me that there should be a closer cooperation between the engineering profession and the Interstate Commerce Commission. There are many men in the American Railway Engineering Association and American Society of Civil Engineers who are expert in accounting for investment in road and equipment, and maintenance of way and structures.

The late Walter G. Berg, chief engineer, Lehigh Valley, was expert on the fundamentals of accounting. He prepared an article in 1904 which was published in Volume 5 of the Proceedings of American Railway Engineering and Maintenance of Way Association. This article is entitled "The Distinction Between Repairs and Improvements and a Proposed Classification of Railroad Maintenance of Way Expenses," and merits careful study.

I mention Mr. Berg's article in support of my opinion that many railroad engineers are not only students of accounting but experts in the preparation of classifications. Mr. Berg was a member of the committee on records, reports and accounts, of which I was chairman. An examination of the reports of this committee for the years 1904, '05, '06 and '07, indicates that the committee offered its services in cooperation with the Association of Railway Accounting Officers in an effort to work out classifications of investment and maintenance accounts based on correct principles. This was previous to the passage of the Hepburn Act.

It seems to me that the Interstate Commerce Commission needs the cooperation of the engineering profession, including American Railway Engineering Association, American Society of Civil Engineers, American Society of Mechanical Engineers, American Institute of Electrical Engineers, and American Engineering Council.

The engineers are particularly interested in the classifications of investment and maintenance accounts, and since the engineers design, construct, and maintain the physical properties, they are in position to make a valuable contribution to the solution of the important accounting questions which are now being considered by the Interstate Commerce Commission.

The *Railway Age* is to be commended for stirring up interest in the question of a proper classification of railway accounts.

EDWIN F. WENDT.

A Railroad Esperantist Speaks

LOUISVILLE, KY.

TO THE EDITOR:

For the benefit of those of your readers interested in the subject, I should like to reply to those who have written to the *Railway Age* on the subject of an auxiliary language.

The suggestion that English may at some time be adopted as such a language is surely made without considering the subject more than superficially. Mr. Orr in his letter has given some of the reasons, and very potent ones, that this cannot happen. Any argument in favor of English in particular is also valid for a host of other languages, especially French. English has the added handicap of being one of the most difficult to learn, and aside from the impossibility of ever inducing the various nations to agree upon any national language for this use, there remains that difficulty for foreigners of learning any natural language. That such an agreement will never be reached in this day of commercial competition is evident when one considers the enormous commercial advantage that the nation whose language was adopted would possess.

Many people oppose the idea from considerations of the effect of such a use upon the language itself. There is no doubt that English as spoken in the United States would soon divide, the language of the street becoming somewhat akin to present day "pidgin" English. The effect upon the English of literature and that spoken by educated people might also be considerable. All this is well known to men who have studied the subject closely, and many of them, realizing the futility of advocacy of such an undertaking, have directed their talents to the creation of an auxiliary language. More than 350 attempts have been made in the last 300 years, of which Esperanto is the only one that has met with any success.

This is undoubtedly due to the manner in which Esperanto has met the fundamental requirements that any language must have to become a real international language. Contrary to general belief, Latin has never played the role of an international language. It functioned only as a court language, principally on the European continent, and only very lightly touched the life of even the middle classes; of the laboring classes not at all. Although it was the language of the church, that institution could not keep it alive. The political divisions of the time were no doubt chiefly responsible for its decline. The need for an international language was felt only in court circles. When this need became pronounced in the commercial and intellectual world, the complications of Latin prevented its being adopted for the purpose.

This leads to the consideration of the chief characteristic that an international language must have, i. e., that of being easy for a man of little education as well as school children to learn—not only to read, but also to write and speak well. There must be economy of vocabulary and regularity of grammar, etc., without touching the flexibility and powers of expression of the language. I place this requirement chief of all; for an international language to succeed as such must be used by the man of the street as well as by educated men. Highly educated men have always to some extent been able to get together by means of some language, for all know at least one other besides their own. From the foregoing considerations alone, it is easy to believe that no natural language can succeed in this field even if governments agreed. Something more than fiat of government is necessary.

Flexibility and power to express accurately slight shades of meaning are also necessary, and beauty of sound very desirable. Means for the control of the growth and expansion of the language must be effective otherwise the language would become unintelligible when spoken by different nationalities.

In meeting this chief condition, Dr. Zamenhof, the creator of Esperanto, used the most logical means possible. He found elements of grammar and vocabulary already existing that were common to all European languages. These he selected and combined to form Esperanto. It seems to English-speaking people that the writers of English text books have overemphasized its similarity to the English language. But the Frenchman and the German get the same perspective when beginning to learn it. The method used in selecting roots was to select the word common to the greatest number of languages. If no word for some idea was common to two or more languages, preference was given to that one which best expressed the idea, or was the shortest, or whose sound corresponded best to the sounds in Esperanto, or which worked best in derivitives. Each root represents an idea which may be made definite (verbal, substantive, etc.) by addition of grammatical endings, affixes, etc. By this method when one learns a new root, it is often equivalent to 20 to 40 words learned. By means of the affixes and compounding, the slightest shade of meaning may be shown. This is of great importance as shown by Mr. Orr in his letter.

Although I listed many of them in my previous letter, for the benefit of those who did not read that letter I give some of the additional features of Esperanto that make it easy to learn: It is phonetic (words are pronounced as spelled and spelled as pronounced); accent always on next-to-last syllable; there are no sounds in the language that English does not have; there are no exceptions to any rule; verbs change only

for time, nouns only for case and number; only two cases, subjective and objective; no grammatical gender (words relating directly to the feminine are formed by the addition of the suffix "in", as; "viro", a man; "virino", a woman); prepositions have a definite meaning that cannot be confused, and there is an indefinite preposition that may be used if one is not certain which is required; a table of correlatives makes these little words, so troublesome in natural languages, easy to learn.

Flexibility and power of accurate expression are inherent in Esperanto because of its structure, and because of its open vowels some linguists have said that it is equal to the Italian in beauty of sound. The question of control of its growth is provided for in the language committee of the Esperanto Academy which exercises jurisdiction in adoption of new roots, etc.

Dr. Zamenhof when he created Esperanto did not go so far as to provide technical terms, realizing quite well that the men who were to use them could select these words much better than he. Such technical vocabularies have already been compiled or are being developed for many branches of the arts and sciences, as medicine, radio, banking, wholesale and retail merchandising, railroads, etc. It should be understood that Esperanto is already capable of expressing the ideas of these departments of endeavor, but agreement is necessary to restrict meanings in certain cases and extend them in others, or for adoption of new roots when necessary. For example, the Esperanto word "vagonaro" is the one generally used by the public to designate a train. Its literal meaning is "a group or collection of cars." But this may be also a switching cut, or group of cars standing on a siding. It is necessary to decide upon some word which will designate a train in the sense given in the book of rules. The word accepted for this use among railroad men is "trajno" (pronounce try-no). Its use, of course, will soon spread to the language of literature. The chief function, so far as the language itself is concerned, of the railroad men's Esperantist association mentioned in my previous letter is the development of a railroad terminology, and this is being done under competent authorities of the academy.

One question raised by Mr. Orr is worthy of attention. Esperanto has passed beyond the experimental stage. It is a living language already having an extensive literature upon many subjects. No claim is made, of course, that it can compare with English in this respect, if it can ever do so. The spheres of the two languages are entirely different. The best evidence of these facts is in the recommendation made by the League of Nations to the International Union of Telegraphs, and accepted by that organization, that Esperanto be accepted on equal footing with national languages for telegraphic purposes. Significant also is the fact that the Japanese medical profession is translating much of its medical literature, and that of other nations, into Esperanto. The enthusiasm of Orientals for Esperanto is evidence of the true internationality of the language. It has already been used in many international congresses with complete success. It belongs to the world, not merely to western Europe as once did Latin.

In conclusion I wish to thank the editor of *Railway Age* for his kindness in devoting space to this discussion. It is a progressive movement appropriate to the times.

C. C. Fears.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Grandmother Brown's Hundred Years 1827-1927, by Harriet Connor Brown. The fine biography of a woman pioneer whose life span coincided with the first century of railroading. Winner of the Atlantic Monthly's $5000 prize for biography, 369 p. Pub. by Little, Brown & Co., Boston, Mass. $3.

A Selected Bibliography on Anthracite. Mining, transportation, commercial and other uses of anthracite coal brought out in this compilation of references. 50 p. Pub. by Anthracite Operators Conference, 1929, New York City. *Apply.*

A Study of Fatigue Cracks in Car Axles Part II, by Herbert F. Moore, Stuart W. Lyon and Norville J. Alleman. Report of an investigation conducted by the Engineering Experiment Station, University of Illinois co-operating with Utilities Research Commission. Issued as Bulletin No. 197 of the Engineering Experiment Station. 30 p. Pub. by University of Illinois, Urbana, Ill. 20 cents.

Unloads of Fresh Fruits and Vegetables at Sixty-Six Important Consuming Markets in the United States Year 1928. Bulletin No. 37 in the Commodity Price Series of the Bureau of Railway Economics. Supply and distribution of 18 important fruits and vegetables and numbers of carloads of each unloaded at the markets specified. 38 p. Pub. by Bureau of Railway Economics, Washington, D. C., *Apply.*

Wanderers: Episodes from the Travels of Lady Emmeline Stuart-Wortley and Her Daughter Victoria 1849-1855, by Mrs. Henry Cust. Nothing more than this book and "Grandmother Brown" are needed to smash the legend that ladies of the last century were fragile and helpless. Railroad travel in America when these ladies traveled was a strenuous affair when it was possible at all (See p. 45-76) while the utmost good humor and iron endurance were required for the other means, especially when crossing the Isthmus of Panama in dugouts or on muleback (Chapter 3) at the height of the gold rush of '49, as a rest cure! 364 p. Pub. by Jonathan Cape, London, England.

Periodical Articles

Conclusions Approved by the Second Pan American Congress of Highways. The Congress was held in Rio de Janeiro in August. "Draft of Pan American convention on automotive traffic" p. 1114-1116. "Co-ordination of transportation facilities" p. 1118-1120 discusses relation of railways and highways. Bulletin of the Pan American Union, November 1929, p. 1107-1123.

Electrification on the Great Northern, by Edward L. Moreland. Historical sketch and discussion of present-day operation. "Record of actual service of each locomotive on a typical day" p. 486. Military Engineer, November-December 1929, p. 481-486.

Loree Has Seen the Railroads Grow Up, by S. J. Woolf. Biographical sketch of the President of the Delaware & Hudson Co. New York Times Magazine, October 27, 1929, p. 7.

Military Railroads During the Civil War, by Eva Swantner. Continuation of articles previously noted. Military value of railways, cost figures, accidents, delays in operation, passes, uses of the telegraph, capture of the "General," and protection of transportation. Concludes with quotation from General Meigs to the effect that more than a million men were transported by rail at much less expenditure of time and effort than if they had marched. Military Engineer, November-December 1929, p. 518-526.

Practical Value of Research in Railroading, by Dr. Julius H. Parmelee. ". . . whatever the future of transportation may be, that future will be determined by conclusions based on research work—study of the past and the present, with the resulting facts applied to the needs and conditions of the future, so far as they may be foreseen and predetermined." p. 270. Special Libraries, September, 1929, p. 266-270.

Railway Engineering in Persia, by Carl L. Meng. History of various efforts to establish rail communication in Persia together with map of the Trans-Persian line. Military Engineer, November-December 1929, p. 544-547.

Sir Casimir Stanislaus Gzowski—A Biography. As chief engineer of some of the early Canadian railways, Sir Casimir made some Canadian railway history. Engineering Journal (Canada) October, 1929. p. 536-544.

Thirty Years of Progress, by Mark Sullivan. "Fundamental changes, material enrichment, outwitting nature, luxuries become necessities, extensions of man's senses, a winning fight against disease, rules and regulations and the good old days" are surveyed. World's Work, November 1929, p. 41-48.

Odds and Ends of Railroading

Might We Call Him a "Sky-Pilot?"

One of the few railway executive officers who are also maritime pilots, is on a railway whose lowest point is over 4,000 ft. above sea level. We refer to B. H. Taylor, vice-president of the Denver & Rio Grande Western, who holds a pilot's license for Chesapeake Bay navigation.

Feminism on the Ascendancy

Nora Barrett has long been a believer in equal rights. For a number of years, she has been crossing watcher on the Louisville & Nashville at Cynthiana, Ky. Miss Barrett maintains that no fool man could have done the job better, nor half as well, for matter of that. She is one of the few female crossing "watchmen" in the country.

A Zoological Delay

A message from Madras, India, reports that passengers on the Nilgiri mountain railway were recently startled when a tiger jumped on to the line while the narrow-gage train was making its slow progress towards Ootacamund. The driver pulled up about 30 yards from the beast, which held its own ground for a considerable time and then moved off the line into the jungle. It is stated that as a result of this incident firearms will be provided for the train staff in the future.

—Railway Gazette

Melodrama Up to Date

With paint on passenger coaches blistered and charred holes in the roofing, a passenger train on the Hudson Bay extension of the Canadian National limped into The Pas, Man., recently. It had successfully run the gauntlet through three miles of smoke and flames of a forest fire. Before taking the plunge, the train stopped and the crew reconnoitered. The passengers were eager to get through. It was decided to make the dash. Once through the furnace of blazing timber, the train again stopped and the crew cleared the roofs of the cars of flaming sticks and put out several small fires.

The Silver Locomotive

The Canadian National, it seems, has tried out a new locomotive which generates its own electricity, hauls a heavy train at 75 miles an hour and saves some incredible amount in the cost of fuel. Of these things, unfortunately, we do not feel qualified to speak. But the fact that the new locomotive is "resplendent in silver-gilt finish," we feel, lies right up our alley. For this is something about which we have had quite a lot to say in the past, and happily to some effect —though we will admit that this might be coincidence. After we had pointed out that locomotives, like coaches, brakemen and conductors, should be togged out in gaudy hues, several roads, among them the Baltimore & Ohio, began togging them out that way, achieving great beauty. We are glad to learn that the Canadian National has followed suit. It should never be forgotten that a railroad train is a magnificent thing. It is going somewhere, bound for an enchanted spot beyond the horizon. Thus it should have at the head of it no grimy thing of black, but a machine of gala appearance. We look forward to the time when all locomotives will be made of silver, with solid gold wheels.

—New York World

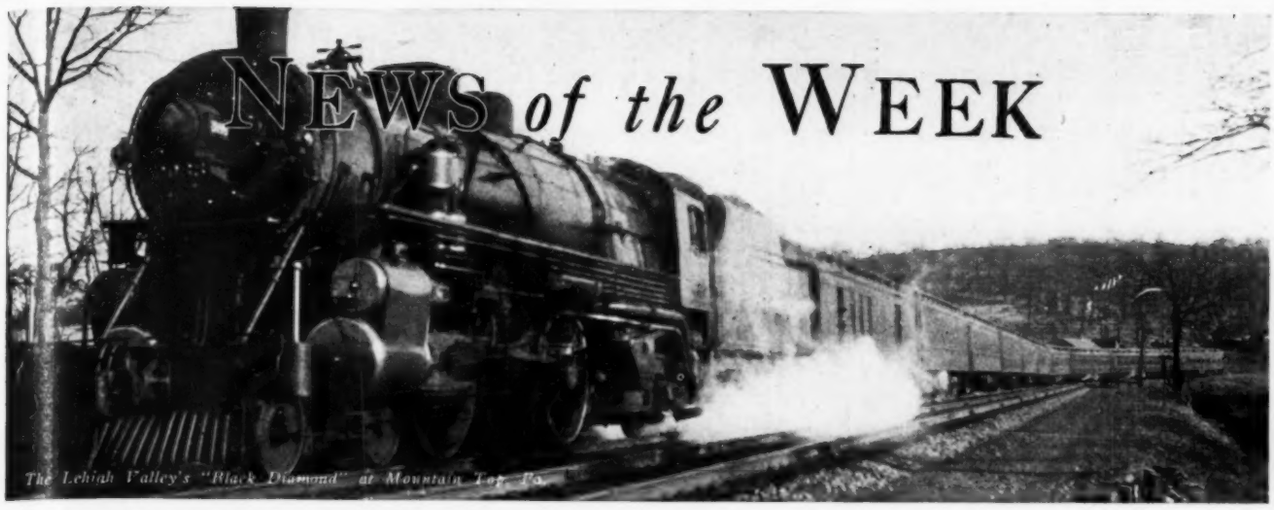
The Central Pacific Rail-Laying Record

Nearly every railroader has heard of the record made, on April 28, 1869, in rail-laying on the old Central Pacific, but the details are not so well-known and will bear repetition: Small flat-cars carried the rails to the end of the line, where each rail was seized by four men who ran forward with it and dropped it into place. Behind these men came a gang which spiked the rail in place with eight spikes and inserted the bolts. Behind these came another gang to drive home the spikes which had been started and to tighten the bolts. Finally came the surfacing gang to throw in the ballast, surface the track, and tamp the ties in place. All of these men were carefully selected for their strength, skill and endurance and were practised in the art of keeping out of each other's way during the feverish activity. By noon, six miles had been laid, but then an hour was lost in bending rails, which were placed on blocks and forced into the desired curves by being struck with heavy hammers. Despite this interruption, 10 miles and 200 ft. of track had been laid by 7 p.m. This work involved bringing up and putting into position, all with the crude methods then used, 25,800 ties, 3,520 rails, 55,000 spikes, 7,040 splices, 14,080 bolts, a total of nearly 4,500,000 lb. The track-laying gang of eignt Irishmen working throughout the day, handled all of these 3,520 rails and laid them, thus carrying more than 1,000 tons of iron.

* * * *

Covered Bridges in New England, on the St. Johnsbury & L ake Champlain: Left: Near Wolcott, Vt.; Center: Near Hardwick, Vt.; Right: Near Morrisville, Vt.

NEWS *of the* WEEK



The Lehigh Valley's "Black Diamond" at Mountain Top, Pa.

E. W. SMITH, vice president of the Pennsylvania Railroad, has been elected president of the Railway Club of Pittsburgh, succeeding W. S. McAbee.

THE TEXAS & NEW ORLEANS has requested the Supreme Court of the United States to review the decision of the court of appeals for the fifth circuit in the case growing out of its dispute with the Brotherhood of Railway and Steamship Clerks.

THE AMERICAN SOCIETY FOR TESTING MATERIALS has selected Atlantic City, N. J., as the location for its 1930 annual meeting, which will be held at Haddon Hall on June 23-27. The executive committee has also decided that the 1931 meeting will be held at the Hotel Stevens, Chicago, on June 22-26.

THE UNITED STATES DISTRICT COURT AT LOS ANGELES, CAL., on October 1 denied the consolidated plea of the Atchison, Topeka & Santa Fe and the Southern Pacific for a temporary injunction restraining the state of Arizona from enforcement of its train limit law. A motion by K. Berry Peterson, attorney general of Arizona, on behalf of the state for dismissal of the railroads' case was taken under advisement by the court.

THE NEW YORK STATE AUTOMOBILE ASSOCIATION has adopted a resolution calling on the Public Service Commission of the State to require the railroad companies to install automatic signals at all grade crossings of highways in the state. As there are about 8000 crossings in New York state, this would mean an expenditure of some sixteen to twenty millions of dollars.

Wage Statistics for August

The number of employees reported by Class I railways as of the middle of August, 1929, was 1,759,553, and the total compensation was $259,985,334, according to the Interstate Commerce Commission's monthly summary of railway wage statistics. Compared with the returns for the corresponding month of 1928, the summary for August, 1929, shows an increase in the total number of employees of 28,782, or 1.66 per cent. The total compensation shows an increase of $9,109,604, or 3.63 per cent. The increase in the number of employees was largely in the maintenance of way and structures group.

Accidents at Grade Crossings

During the first six months this year, 1,120 persons lost their lives as a result of accidents at highway grade crossings, an increase of 23 compared with the same period in 1928, according to reports filed by the railroads with the Interstate Commerce Commission. Persons injured totaled 3,026, an increase of 92.

N. Y. Railroad Club Meeting

The New York Railroad Club will hold its next meeting on November 15 at the United Engineering Society's auditorium, 29 West Thirty-ninth street, New York, at 8 p. m. The speaker of the evening will be John L. Bacon of the Cut-Off and Speed Recorder Corporation whose subject will be "Calibrating the Human Factor". He will describe modern methods of recording important phases of locomotive operation, illustrating his address with charts, lantern slides and a working model.

Radio Favored by Passengers

The Grisby-Grunow Company recently conducted a four-day survey on one of the western railroads equipped with Majestic radios, to determine whether the majority of passengers enjoyed or were annoyed by radios on trains. In the course of the investigation over 500 passengers were asked to sign a questionnaire card which inquired whether the passenger favored radio entertainment on trains or whether he objected to such entertainment. Out of the 500 passengers only 5 stated definitely that they objected to radios.

Progress on C. N. R. Branch Lines

Favorable weather has enabled work to proceed very rapidly during the past three months on the three years program of branch line construction on the Canadian National in western Canada. H. A. Dixon, regional chief engineer, says that the Aberdeen-Melfort line is fully graded, 50 per cent of the steel has been laid and 25 per cent of the roadbed is already ballasted.

The branch lines to the Sherritt-Gordon and Flin Flon line in northern Manitoba have been turned over to the operating department by the engineers. Regular service, twice a week, is being maintained on the Hudson Bay Railway as far as Owl River, mile 412. The complete line to Fort Churchill on Hudson bay will not be in operation until next summer.

P. R. R. Track Prizes

Cash prizes, totaling $3,300, were awarded on November 2, for the best track on the main lines of the Pennsylvania's Western region by W. C. Higginbottom, general manager at Chicago. An award of $800, known as the Klondike prize, was given to Allen F. Roper, track supervisor of Morrow, Ohio, the line and surface of his subdivision being selected as the best on the entire Western region. Supervisor Roper's territory is between Xenia and Milford, Ohio, a distance of 50 miles on the main line between Cincinnati and Columbus. This is the second time in three years that Mr. Roper has won an award for the excellent condition of his track, following the annual inspections. A prize of $700 went to Jasper N. Sagestor, of Urbana, Ohio, supervisor of subdivision No. 2 of the Columbus division. Supervisor Sagester's territory showed the greatest improvement for the year. It extends from St. Paris to Marble Cliff, Ohio, a distance of a little more than 52 miles on the main line from St. Louis to the east. He has been a supervisor since 1927.

Exports of Car Parts Increase

According to reports of the Department of Commerce, exports of railway car parts (exclusive of axles and wheels) from the United States during the first six months of the current year increased by 92 per cent over exports for the corresponding period of 1928. Foreign sales of this equipment in the first half of 1928 amounted to $1,479,017, while in the same part of 1929 the total was $2,843,150. Exports of air brake equipment were valued at $501,673, a decrease of $141,061 from the total of $642,734 for the same period of 1928. Exports of signals, switches and electric attachments increased $83,807 from

(Continued on page 1118)

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1929

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1928.
Akron, Canton & Youngstown	Sept.	171	$316,582	$128	$327,176	$51,458	$27,538	$13,952	$79,354	$16,924	$189,226	57.8	$137,950	$114,891	$87,199	$89,799
	9 mos.	171	2,920,026	1,318	3,031,380	397,680	243,216	125,279	711,305	158,348	1,634,250	53.9	1,397,130	1,195,131	899,737	528,851
Atchison, Topeka & Santa Fe	Sept.	9,662	14,363,782	2,809,597	18,804,299	2,695,945	3,333,852	387,759	5,117,849	437,159	11,935,903	63.5	6,868,396	5,185,152	5,100,668	4,996,764
	9 mos.	9,663	121,723,604	27,098,872	165,018,796	24,961,100	30,301,621	3,718,503	43,315,421	3,978,898	108,062,316	65.5	56,956,480	42,759,532	42,704,472	29,542,085
Gulf, Colorado & Santa Fe	Sept.	1,944	2,206,212	158,555	2,528,560	512,729	429,810	54,502	706,312	78,012	1,777,312	70.3	751,248	635,286	506,370	793,355
	9 mos.	1,944	18,077,278	1,602,583	21,159,757	4,644,457	4,035,504	502,898	6,318,045	666,173	16,073,168	76.0	5,086,589	4,232,236	3,115,391	2,448,130
Panhandle & Santa Fe	Sept.	1,568	1,226,280	110,954	1,433,922	219,446	238,442	16,583	389,925	37,377	895,821	62.5	538,101	465,576	363,733	493,718
	9 mos.	1,534	11,425,865	940,860	13,312,324	2,733,628	2,163,362	176,736	3,517,973	320,872	8,733,804	65.6	4,578,520	4,304,658	3,142,329	3,076,533
Atlanta & West Point	Sept.	93	170,091	47,175	251,097	37,659	36,333	12,463	88,890	12,821	193,058	76.9	58,039	46,820	30,234	33,694
	9 mos.	93	1,442,082	435,992	2,172,224	312,597	381,271	111,694	826,291	124,081	1,797,741	82.8	374,483	253,608	131,695	231,448
Western of Alabama	Sept.	133	188,656	51,059	264,294	38,750	52,301	12,762	81,093	12,807	201,989	76.4	62,305	48,105	52,449	11,983
	9 mos.	133	1,550,933	463,099	2,248,367	414,578	449,076	114,541	751,314	122,407	1,878,064	83.5	370,303	241,304	273,259	586,469
Atlanta, Birmingham & Coast	Sept.	639	329,049	23,871	395,174	87,508	82,784	28,178	136,657	18,005	362,427	91.7	32,747	15,596	8,670	—14,203
	9 mos.	639	2,968,482	203,575	3,600,055	802,436	747,910	255,437	1,389,565	167,420	3,459,089	96.1	140,966	—11,197	—121,523	—147,497
Atlantic Coast Line	Sept.	5,152	3,521,084	647,683	4,652,384	778,241	1,089,789	167,125	1,790,916	167,401	4,024,969	86.5	627,415	175,147	434,291	46,080
	9 mos.	5,151	41,461,776	9,910,936	56,542,503	7,787,386	10,422,278	1,463,063	18,745,521	1,577,463	40,496,021	71.6	16,046,482	11,178,281	11,086,675	6,668,116
Charleston & Western Carolina	Sept.	342	224,561	11,508	247,410	44,039	33,722	8,259	86,779	7,086	179,857	72.7	67,553	41,053	43,302	49,195
	9 mos.	342	2,248,790	94,606	2,439,820	508,818	344,375	64,579	857,027	64,061	1,838,406	75.4	601,414	377,813	362,991	303,840
Baltimore & Ohio	Sept.	5,639	18,669,900	1,887,239	22,042,279	2,837,521	4,226,093	480,052	6,916,706	659,033	15,303,716	69.4	6,738,563	5,639,821	5,272,802	5,825,868
	9 mos.	5,639	155,465,564	17,001,699	186,089,394	22,605,435	38,739,444	4,476,648	62,077,510	6,187,100	135,762,775	73.0	50,326,619	40,863,361	38,258,473	34,342,586
Baltimore & Ohio Chic. Term	Sept.	82	.....	.....	378,518	40,663	35,175	2,708	170,515	18,812	270,863	71.6	107,655	41,220	136,522	168,668
	9 mos.	82	.....	.....	3,364,560	395,769	397,048	21,629	1,625,450	160,277	2,636,906	78.4	727,654	154,394	1,085,516	1,038,684
Staten Island Rapid Transit	Sept.	23	87,294	143,318	246,192	19,674	13,036	1,959	104,641	16,698	156,008	63.4	90,184	72,184	66,529	33,992
	9 mos.	23	640,683	1,233,864	1,995,299	217,990	152,331	18,380	961,757	142,478	1,492,936	74.8	502,363	343,546	288,108	235,379
Bangor & Aroostook	Sept.	619	651,939	37,589	718,358	118,480	117,935	5,234	150,436	23,868	418,606	58.3	299,752	241,281	247,376	98,086
	9 mos.	619	4,910,180	433,564	5,727,878	992,843	1,068,425	52,148	1,400,805	240,758	3,777,880	66.0	1,949,998	1,493,453	1,616,876	1,376,745
Belt Ry. Co. of Chicago	Sept.	48	.....	.....	748,397	50,649	71,275	3,795	311,467	12,399	449,585	60.1	298,812	237,701	141,057	150,604
	9 mos.	48	.....	.....	6,251,938	609,228	669,248	34,304	2,788,896	134,010	4,235,686	67.7	2,016,252	1,498,044	1,355,491	1,300,793
Bessemer & Lake Erie	Sept.	227	1,869,357	8,253	1,803,951	36,832	315,065	14,057	362,284	34,140	692,643	38.4	1,111,308	972,758	981,172	862,161
	9 mos.	227	13,708,904	69,728	13,992,275	1,029,980	2,929,978	128,181	2,938,964	320,371	7,324,455	52.3	6,667,820	5,837,291	5,998,600	4,030,019
Bingham & Garfield	Sept.	33	40,675	.....	42,374	10,726	6,908	1,466	11,918	4,998	36,141	85.3	6,238	—778	14,912	18,075
	9 mos.	33	401,108	.....	423,603	72,683	41,556	14,147	100,117	40,254	270,070	63.8	153,533	42,226	192,554	147,001
Boston & Maine	Sept.	2,077	4,442,489	1,566,282	6,941,161	1,238,511	1,360,367	90,790	2,217,809	207,732	5,147,545	74.2	1,793,616	1,455,918	1,210,725	1,175,827
	9 mos.	2,077	38,358,899	12,449,290	58,448,803	10,095,126	10,255,096	831,927	20,080,020	1,948,475	43,419,916	74.3	15,028,887	12,122,082	10,108,335	9,807,088
Brooklyn Eastern District Term	Sept.	11	106,980	.....	110,109	8,678	15,476	64	37,767	6,593	68,578	62.3	41,531	33,970	33,970	33,646
	9 mos.	11	1,059,566	.....	1,084,070	89,552	133,210	5,044	374,913	59,611	662,330	61.1	421,740	354,000	354,000	354,378
Buffalo & Susquehanna	Sept.	253	123,427	694	138,796	30,651	51,270	1,923	42,735	7,474	134,053	96.6	4,743	2,643	20,129	38,692
	9 mos.	253	1,187,995	8,618	1,299,986	262,565	456,260	16,716	396,727	69,836	1,202,104	92.5	97,882	98,075	237,509	183,295
Buffalo, Rochester & Pittsburgh	Sept	601	1,441,443	67,387	1,561,454	290,441	389,929	36,544	522,921	41,991	1,282,719	82.1	278,735	228,732	266,364	230,177
	9 mos.	601	12,182,861	647,538	13,348,103	1,709,546	3,761,719	301,228	4,737,369	397,559	10,919,964	81.8	2,428,139	2,017,341	2,242,934	2,145,221
Canadian Pacific Lines in Maine	Sept.	233	109,131	26,212	148,433	89,279	41,022	7,882	73,796	3,950	215,929	145.4	—67,496	—81,996	—95,193	—66,949
	9 mos.	233	1,801,167	292,382	2,207,908	528,403	466,813	64,189	987,011	37,057	2,083,473	94.4	124,435	—6,065	—205,746	—164,986
Canadian Pacific Lines in Vermont	Sept.	85	104,659	40,634	167,616	25,130	22,987	2,040	91,638	2,672	144,253	86.1	23,363	19,343	—16,903	—9,170
	9 mos.	85	1,053,525	344,025	1,610,333	334,234	273,632	16,786	850,166	21,496	1,495,537	92.9	114,796	78,616	—228,342	—1,036,955
Central of Georgia	Sept.	1,944	1,769,774	250,448	2,204,772	365,793	377,519	69,981	760,738	85,413	1,664,522	75.5	540,250	396,492	426,379	386,110
	9 mos.	1,944	14,344,578	2,676,480	18,888,502	2,658,659	3,295,339	638,206	6,993,006	786,527	14,486,781	76.7	4,401,721	3,215,258	3,296,335	3,059,760
Central of New Jersey	Sept.	690	3,799,579	864,801	4,990,967	509,144	981,337	68,478	1,778,546	129,900	3,495,934	70.0	1,495,033	971,274	881,035	910,282
	9 mos.	690	33,182,770	7,082,662	43,214,159	4,246,949	9,011,400	559,363	16,290,417	1,171,772	31,542,848	73.0	11,671,311	7,843,452	6,632,919	6,884,765
Central Vermont	Sept.	413	560,701	111,097	761,198	157,150	95,812	19,264	277,999	21,670	574,175	75.4	187,023	155,170	166,390	105,639
	9 mos.	413	5,069,729	952,661	6,865,476	1,377,758	877,545	165,891	2,612,188	228,695	5,281,382	76.9	1,584,094	1,425,197	1,452,866	—1,441,275
Chesapeake & Ohio	Sept.	2,735	10,615,321	574,763	11,659,793	1,612,505	2,376,046	137,005	2,724,014	298,180	7,160,573	61.4	4,499,220	3,799,014	4,002,305	3,873,349
	9 mos.	2,731	87,491,245	4,916,050	96,323,117	14,200,350	21,433,004	1,220,305	24,146,143	2,631,617	63,792,003	66.2	32,531,114	26,246,848	27,984,235	25,229,022
Chicago & Alton	Sept.	1,028	1,775,805	409,018	2,440,842	405,159	487,103	82,802	839,555	60,119	1,884,139	77.2	556,703	441,577	250,407	405,214
	9 mos.	1,028	15,195,282	4,120,535	21,896,560	2,568,734	4,732,319	698,560	7,874,101	548,604	16,547,935	75.6	5,348,625	4,338,605	2,710,610	1,845,162
Chicago & Eastern Illinois	Sept.	946	1,740,666	353,228	2,278,219	256,130	496,379	80,326	754,719	69,319	1,669,096	73.3	609,123	453,566	300,135	376,989
	9 mos.	946	14,752,275	2,610,553	19,264,606	2,381,803	3,967,164	742,120	6,977,529	639,947	14,835,345	77.0	4,429,261	3,216,117	1,838,941	1,147,600
Chicago & Illinois Midland	Sept.	131	245,400	3,972	259,820	38,410	45,570	19,822	67,845	17,485	188,884	72.7	70,936	63,001	62,986	31,068
	9 mos.	131	2,082,383	49,576	2,204,547	326,139	480,128	172,479	619,497	160,582	1,757,796	79.7	446,751	375,336	363,396	322,062
Chicago & North Western	Sept.	8,466	10,745,557	1,991,245	14,252,614	1,972,330	2,449,700	218,690	4,666,217	386,006	9,708,652	68.1	4,543,962	3,593,141	3,252,596	3,418,689
	9 mos.	8,466	84,828,337	18,503,623	117,346,412	15,914,954	21,717,105	1,987,661	42,585,298	3,449,632	86,198,674	73.3	31,347,738	23,875,876	21,777,630	18,682,347

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1929

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1929—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1928.
Chicago, Burlington & Quincy	Sept.	9,373	$11,401,145	$1,733,057	$14,618,636	$2,248,654	$2,113,102	$233,327	$4,359,041	$368,490	$9,440,486	64.1	$5,178,150	$4,002,017	$3,577,132	$3,686,708
	9 mos.	9,374	93,985,213	14,528,255	121,171,748	18,311,673	18,722,040	2,569,066	38,681,507	3,333,716	82,498,102	68.0	38,673,646	28,826,819	26,479,460	23,576,544
Chicago Great Western	Sept.	1,495	1,868,542	228,207	2,324,515	315,651	353,492	73,626	840,471	52,431	1,647,674	70.9	676,841	573,659	392,060	379,723
	9 mos.	1,495	15,316,827	2,182,864	19,171,026	2,534,092	3,353,254	743,262	7,776,818	514,600	15,011,250	78.3	4,159,776	3,384,293	1,881,778	1,611,774
Chicago, Indianapolis & Louisville	Sept.	650	1,245,579	175,662	1,580,157	171,791	311,480	37,916	522,142	36,573	1,089,878	69.0	490,279	391,108	269,586	294,917
	9 mos.	650	10,688,317	1,479,297	13,718,636	1,390,284	2,819,349	358,284	4,785,230	331,066	9,797,482	71.4	3,921,154	3,101,643	1,982,670	1,934,155
Chicago, Mil., St. Paul & Pacific	Sept.	11,247	13,150,415	1,422,568	16,107,777	2,981,728	2,542,084	315,222	5,015,438	359,450	11,296,827	70.1	4,810,950	3,902,891	3,111,434	3,702,209
	9 mos.	11,248	103,717,468	12,957,285	129,765,762	22,158,143	23,328,329	2,949,975	45,389,822	3,391,112	97,876,715	75.4	31,889,047	24,594,775	19,569,007	19,808,782
Chicago River & Indiana	Sept.	20	.....	.....	611,884	51,973	46,633	352	197,936	15,093	311,987	51.0	299,897	247,201	339,952	301,127
	9 mos.	20	.....	.....	5,282,217	427,310	471,563	4,714	1,898,678	134,223	2,936,488	55.6	2,345,729	1,949,340	2,718,360	2,443,976
Chicago, Rock Island & Pacific	Sept.	7,547	9,354,430	1,585,669	12,050,568	1,684,749	2,160,778	277,742	3,971,745	353,995	8,518,369	70.7	3,532,199	2,861,422	2,432,256	2,430,516
	9 mos.	7,558	80,791,742	14,091,104	104,562,087	14,619,098	20,043,173	2,365,916	37,255,208	3,186,731	78,208,797	74.8	26,353,290	20,171,966	15,871,339	16,057,172
Chicago, Rock Island & Gulf	Sept.	550	560,315	57,713	661,766	72,421	55,151	21,905	192,314	17,622	364,015	55.0	297,751	265,056	225,947	111,739
	9 mos.	535	4,975,807	571,414	6,020,199	604,756	543,384	193,090	1,877,514	170,030	3,416,109	56.7	2,604,090	2,370,567	2,009,974	1,235,376
Chicago, St. Paul, Minn. & Omaha	Sept.	1,746	2,041,431	345,367	2,587,296	334,221	403,750	38,590	906,627	82,112	1,779,777	68.8	807,519	657,336	546,257	473,299
	9 mos.	1,746	15,322,970	3,149,898	20,365,007	2,944,722	3,577,574	355,620	8,407,306	732,886	16,121,915	79.2	4,243,092	3,223,358	2,608,135	1,473,650
Clinchfield	Sept.	309	536,817	13,803	562,627	54,797	147,444	21,782	109,026	17,950	351,202	62.4	211,425	151,425	288,212	320,194
	9 mos.	309	4,926,795	128,704	5,162,086	569,136	1,294,151	197,942	1,060,931	163,796	3,285,490	63.6	1,876,596	1,216,451	1,968,550	2,107,700
Colorado & Southern	Sept.	1,035	867,522	124,998	1,088,108	209,075	208,486	15,218	330,402	41,495	794,459	73.0	293,649	293,149	189,603	351,000
	9 mos.	1,035	6,948,914	886,332	8,628,057	1,520,618	1,934,930	143,067	3,016,057	377,416	7,017,269	81.3	1,610,788	987,465	753,772	1,156,388
Ft. Worth & Denver City	Sept.	696	748,418	162,502	982,073	134,368	166,835	20,494	292,016	37,919	655,974	66.8	326,099	254,911	226,361	329,282
	9 mos.	696	7,196,976	1,301,328	9,121,265	1,204,898	1,497,274	205,268	2,663,544	354,314	5,964,290	65.4	3,156,975	2,618,238	2,439,545	2,361,831
Wichita Valley	Sept.	271	106,525	9,026	124,058	21,222	7,845	20	37,236	1,443	68,411	55.1	55,647	51,090	29,587	25,907
	9 mos.	271	915,641	77,883	1,050,947	200,474	74,503	266	346,418	14,614	633,486	60.3	417,461	354,548	160,329	210,192
Columbus & Greenville	Sept.	167	155,968	18,444	185,754	24,687	17,467	4,269	58,888	12,044	117,001	63.0	68,753	57,950	43,310	33,283
	9 mos.	167	1,100,660	149,684	1,340,655	317,682	158,799	33,513	472,373	105,221	1,084,600	80.9	256,055	217,967	111,724	14,398
Conemaugh & Black Lick	Sept.	23	130,611	.....	206,881	17,577	25,726	1,016	95,372	3,360	143,051	69.1	63,830	42,830	43,764	56,845
	9 mos.	23	931,672	.....	1,665,826	151,216	260,931	6,357	874,826	30,511	1,323,841	79.5	341,985	312,985	311,196	162,321
Delaware & Hudson	Sept.	881	2,990,213	371,293	3,626,161	397,083	774,718	55,225	1,188,319	166,464	2,612,002	72.0	1,014,159	925,074	929,030	600,854
	9 mos.	881	25,778,302	2,620,958	30,670,371	3,723,067	7,145,274	512,758	11,179,546	1,467,425	24,133,440	78.7	6,536,931	5,734,457	5,663,991	4,289,596
Delaware, Lackawanna & Western	Sept.	998	5,244,146	1,033,188	7,120,054	650,252	1,116,503	141,333	2,565,648	175,449	4,674,979	65.7	2,445,075	1,796,926	1,854,803	1,711,268
	9 mos.	998	44,995,641	8,595,298	61,106,465	5,944,531	10,788,972	1,293,293	23,612,072	1,600,890	43,534,577	71.2	17,571,888	12,402,727	12,522,330	11,365,631
Denver & Rio Grande Western	Sept.	2,563	3,023,112	368,107	3,630,760	575,010	522,963	62,770	1,004,646	91,025	2,300,762	63.4	1,329,998	1,079,934	1,152,037	1,014,603
	9 mos.	2,556	19,984,501	2,765,202	24,925,789	4,155,737	4,807,496	566,422	7,190,069	817,630	17,880,340	71.7	7,045,449	5,347,564	6,040,270	4,358,413
Denver & Salt Lake	Sept.	232	378,560	14,757	418,213	47,310	55,088	3,530	56,746	18,558	176,654	42.2	241,559	222,558	233,131	200,875
	9 mos.	232	2,303,156	156,193	2,715,913	533,957	581,503	20,294	431,032	124,801	1,677,915	61.8	1,037,998	939,976	1,003,721	967,745
Detroit & Mackinac	Sept.	273	122,825	11,790	145,298	40,788	24,330	2,627	35,860	6,390	104,027	71.6	41,271	31,764	34,606	27,106
	9 mos.	288	1,046,934	100,015	1,254,344	278,551	263,753	20,236	368,301	56,554	948,708	75.6	305,636	230,754	246,828	145,701
Detroit & Toledo Shore Line	Sept.	50	378,741	.....	387,035	31,971	34,830	51,414	95,695	26,177	237,847	61.5	149,188	115,721	37,112	88,958
	9 mos.	54	3,796,600	.....	3,864,509	366,250	334,291	322,031	919,991	180,323	2,120,479	54.9	1,744,130	1,425,476	685,458	847,643
Detroit Terminal	Sept.	19	.....	.....	176,623	18,283	17,336	.....	83,054	4,538	123,211	69.8	53,412	36,569	36,798	64,905
	9 mos.	19	.....	.....	2,064,314	208,106	183,727	1	881,307	39,563	1,312,704	63.6	751,610	566,757	572,435	484,307
Detroit, Toledo & Ironton	Sept.	488	1,032,185	2,903	1,065,967	172,396	150,343	11,925	278,889	35,570	647,498	60.7	418,469	369,305	316,711	325,234
	9 mos.	494	11,191,158	28,685	11,461,408	1,404,690	1,525,255	107,364	2,645,075	283,058	5,950,437	51.9	5,510,971	4,895,707	4,135,358	1,536,053
Duluth & Iron Range	Sept.	269	832,290	4,095	955,499	120,668	103,596	1,144	181,914	21,558	428,880	44.9	526,619	460,622	463,438	508,796
	9 mos.	269	5,324,508	41,738	6,135,954	939,345	989,099	13,924	1,336,632	197,736	3,476,038	56.7	2,659,916	2,213,894	2,223,717	1,501,368
Duluth, Missabe & Northern	Sept.	305	2,531,110	3,269	2,868,751	183,063	180,325	3,078	380,835	23,065	770,333	26.9	2,098,418	1,847,224	1,848,845	1,789,388
	9 mos.	306	15,138,143	34,481	17,207,113	1,344,460	1,650,053	26,725	2,624,396	210,265	5,855,553	34.0	11,351,560	9,688,937	9,668,974	6,828,449
Duluth, Winnipeg & Pacific	Sept.	178	159,164	18,185	191,206	44,706	48,991	4,784	67,152	7,789	177,340	92.7	13,866	3,431	11,648	44,014
	9 mos.	178	1,694,623	130,552	1,917,127	413,272	386,338	44,011	658,562	74,650	1,607,007	83.8	310,120	211,948	226,793	253,352
Elgin, Joliet & Eastern	Sept.	453	1,987,569	96	2,188,029	241,742	371,759	15,185	742,283	50,804	1,420,662	64.9	767,367	635,722	438,457	345,373
	9 mos.	453	18,687,733	171	20,527,300	1,901,676	3,416,269	136,684	6,913,838	476,709	12,834,366	62.5	7,692,934	6,516,472	4,707,351	3,484,806
Erie Railroad	Sept.	2,046	8,285,737	886,604	10,018,650	1,406,420	2,248,036	177,197	3,546,767	303,700	7,728,222	77.1	2,290,428	1,834,135	1,792,724	2,161,325
	9 mos.	2,046	70,097,622	7,951,138	85,497,586	10,291,115	19,816,628	1,651,809	31,651,368	2,753,505	66,590,942	77.9	18,906,644	14,912,665	14,498,265	12,418,103
Chicago & Erie	Sept.	269	1,136,846	64,135	1,310,932	179,975	127,535	29,589	382,936	44,241	762,777	58.2	548,155	490,147	176,595	172,757
	9 mos.	269	10,230,835	494,911	11,732,293	1,454,167	1,244,674	270,432	3,275,022	384,131	6,621,781	56.4	5,110,512	4,602,295	1,953,793	1,240,362
New Jersey & New York	Sept.	45	25,433	95,774	126,229	31,138	20,967	1,574	68,039	3,598	125,297	99.3	932	—3,178	—37,105	—9,194
	9 mos.	45	239,823	869,617	1,162,534	170,613	199,788	16,152	615,892	33,635	1,036,033	89.1	126,501	89,507	—209,072	—192,895
N. Y., Susquehanna & Western	Sept.	131	323,873	40,921	399,637	64,201	51,891	4,829	158,448	15,144	294,513	73.7	105,124	74,011	56,286	29,877
	9 mos.	131	2,994,420	388,463	3,721,158	528,749	474,751	47,751	1,650,481	114,030	2,814,876	75.6	906,282	626,189	412,657	230,362

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1929—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1928.
Evansville, Indianap. & Terre Haute	Sept.	146	$131,788	$3,391	$145,572	$30,799	$16,345	$1,852	$50,519	$4,407	$103,908	71.4	$41,664	$35,916	$11,633	—$6,899
	9 mos.	146	1,362,507	30,480	1,460,542	237,858	178,792	17,171	506,575	44,820	984,925	67.4	475,617	428,556	144,919	—3,743
Florida East Coast	Sept.	853	414,901	140,515	642,722	156,489	169,308	24,132	243,317	44,542	647,065	100.7	—4,343	—149,903	—187,968	—199,628
	9 mos.	853	5,820,534	3,386,188	10,584,629	1,388,530	1,599,797	256,663	2,920,242	427,819	6,781,788	64.1	3,802,841	2,495,843	1,877,578	1,395,154
Fort Smith & Western	Sept.	249	118,097	9,230	134,643	24,112	28,308	5,547	41,027	6,565	104,880	77.9	29,763	25,036	17,092	31,169
	9 mos.	249	903,761	81,171	1,068,223	218,749	222,883	52,889	355,779	64,739	909,864	85.2	158,359	115,808	33,563	—18,630
Galveston Wharf	Sept.	13	.....	.....	210,898	43,738	4,752	4,076	33,556	5,969	110,757	52.6	100,141	58,341	59,311	112,792
	9 mos.	13	.....	.....	1,657,144	391,139	46,111	39,867	293,551	54,834	988,191	59.6	668,953	453,353	454,559	487,018
Georgia R. R.	Sept.	328	362,057	52,064	447,173	63,639	76,681	21,903	187,414	22,930	372,936	83.4	74,237	66,079	81,916	62,211
	9 mos.	328	3,184,623	490,925	3,970,703	477,397	754,023	202,356	1,650,218	213,735	3,297,239	83.0	673,464	575,023	701,364	626,609
Georgia & Florida	Sept.	502	135,541	9,064	151,998	25,840	22,873	9,586	55,723	8,744	122,987	80.9	29,011	19,311	17,459	4,373
	9 mos.	470	1,161,821	89,800	1,335,466	245,996	203,125	88,740	525,604	77,329	1,131,429	84.7	204,037	116,612	136,128	155,259
Grand Trunk Western	Sept.	345	1,633,934	175,775	1,961,264	298,214	342,743	44,459	598,510	61,401	1,346,015	68.6	615,249	520,676	459,084	342,971
	9 mos.	345	14,840,937	1,613,055	17,396,017	2,535,251	3,431,616	404,296	5,725,406	582,191	12,708,142	73.1	4,687,875	3,848,173	2,833,049	2,732,466
Atlantic & St. Lawrence	Sept.	166	130,018	22,557	172,627	34,298	32,090	6,121	105,490	8,716	188,776	109.3	—16,149	—30,817	—80,560	—65,313
	9 mos.	166	1,371,088	234,808	1,795,643	454,841	398,924	54,913	888,900	76,866	1,888,655	105.2	—93,012	—231,003	—693,697	—859,042
Chicago, Det. & Can. Gr. Tr. Jct.	Sept.	59	229,722	3,594	280,770	28,547	14,404	4,348	90,039	3,416	140,737	50.1	140,033	128,771	96,084	170,019
	9 mos.	59	2,599,775	9,671	3,023,465	190,176	137,627	42,354	874,133	33,187	1,277,235	42.2	1,746,230	1,645,546	1,370,975	1,369,022
Detroit, Grand Haven & Mil.	Sept.	192	563,780	28,770	653,659	73,902	60,750	13,398	276,521	17,538	436,104	66.7	217,555	202,569	62,097	245,749
	9 mos.	192	6,375,294	221,167	7,074,211	671,549	565,859	126,468	2,591,365	162,361	4,083,377	57.7	2,990,834	2,867,373	1,793,548	1,575,045
Great Northern	Sept.	8,367	11,213,341	1,094,589	13,528,907	1,666,794	1,812,758	215,296	3,457,253	226,094	7,511,177	55.5	6,017,730	5,166,074	4,888,285	5,424,711
	9 mos.	8,394	75,009,191	8,650,525	94,215,282	15,108,941	15,456,429	2,365,651	28,285,586	2,053,697	64,233,366	68.2	29,981,916	23,278,521	22,562,240	18,855,706
Green Bay & Western	Sept.	234	160,853	3,478	170,645	34,253	24,246	7,312	53,146	2,659	121,616	71.3	49,029	39,029	38,654	22,771
	9 mos.	234	1,387,852	43,588	1,483,172	246,616	216,134	61,123	566,737	28,401	1,117,988	75.4	365,184	288,136	239,986	201,605
Gulf & Ship Island	Sept.	307	239,429	27,363	283,917	68,330	36,664	5,571	90,626	7,013	210,874	74.3	73,043	39,301	24,241	14,051
	9 mos.	307	1,929,864	324,682	2,461,425	547,145	449,349	46,104	913,975	70,803	2,056,607	83.6	404,818	114,426	—24,369	—8,530
Gulf, Mobile & Northern	Sept.	733	671,162	28,453	723,543	98,784	94,491	33,826	186,380	30,581	444,347	61.41	279,196	225,598	181,327	147,122
	9 mos.	733	5,170,141	237,575	5,684,971	840,867	872,750	293,876	1,659,214	262,531	3,932,277	69.17	1,752,694	1,356,350	1,038,385	869,971
Hocking Valley	Sept.	348	1,575,179	52,738	1,844,397	219,615	304,195	16,701	475,040	44,127	1,057,971	57.4	786,426	650,358	565,848	644,762
	9 mos.	348	13,654,748	496,443	15,672,837	1,909,280	2,859,868	149,620	4,168,753	406,326	9,483,005	60.5	6,189,832	5,023,404	4,424,229	3,791,676
Illinois Central	Sept.	5,019	11,033,547	1,542,714	13,444,180	1,751,543	3,045,269	249,459	4,338,840	356,385	9,823,084	73.1	3,621,096	2,575,730	2,534,760	2,751,029
	9 mos.	5,030	90,767,719	15,680,136	115,335,776	14,273,103	27,337,494	2,348,454	40,432,508	3,252,164	88,542,217	76.8	26,793,559	18,739,993	18,469,360	18,030,759
Yazoo & Mississippi Valley	Sept.	1,705	2,342,983	300,743	2,796,985	442,288	469,443	43,914	850,936	65,088	1,878,004	67.1	918,981	759,328	672,108	304,581
	9 mos.	1,705	16,000,310	2,335,694	19,591,092	3,521,375	3,860,867	394,769	7,527,115	584,481	15,943,066	81.4	3,648,026	2,133,316	1,472,259	1,321,112
Illinois Central System	Sept.	6,724	13,391,611	1,847,859	16,260,649	2,193,831	3,518,848	293,373	5,198,441	421,583	11,713,999	72.0	4,546,650	3,340,715	3,212,525	3,059,392
	9 mos.	6,735	106,886,648	18,049,211	135,078,879	17,794,478	31,251,377	2,743,223	48,037,903	3,837,889	104,617,823	77.4	30,461,056	20,884,536	19,952,846	19,322,676
Illinois Terminal	Sept.	473	462,078	113,074	606,032	105,364	86,481	16,784	190,389	32,884	429,252	70.84	176,780	155,518	117,536	110,776
	9 mos.	473	4,027,185	1,155,833	5,418,515	755,704	787,325	172,640	1,783,559	330,777	3,820,873	70.52	1,597,642	1,406,156	1,047,286	811,753
Kansas City Southern	Sept.	784	1,408,386	109,446	1,701,988	200,606	267,879	63,049	450,486	79,998	1,065,749	62.6	636,239	518,616	462,644	455,721
	9 mos.	784	11,757,116	807,603	14,143,158	1,734,033	2,335,235	563,539	4,109,017	761,141	9,516,252	67.3	4,626,906	3,567,881	3,030,553	2,829,701
Texarkana & Ft. Smith	Sept.	81	240,540	7,790	272,742	26,383	24,777	7,882	49,362	11,156	122,459	44.9	150,283	133,321	100,193	99,600
	9 mos.	81	2,133,195	62,893	2,380,467	222,849	214,141	67,734	530,966	99,850	1,152,651	48.4	1,227,816	1,067,447	766,229	607,096
Kansas, Oklahoma & Gulf	Sept.	326	304,451	2,392	312,759	36,159	33,256	15,652	64,217	10,118	158,571	50.7	154,188	134,128	110,064	161,628
	9 mos.	326	2,641,724	23,405	2,726,574	318,635	260,235	133,631	595,523	98,564	1,385,398	50.8	1,341,176	1,160,954	959,837	607,430
Lake Superior & Ishpeming	Sept.	160	348,926	570	411,286	57,189	27,645	484	67,254	6,039	158,575	38.6	252,711	211,956	209,780	180,262
	9 mos.	160	2,199,946	9,584	2,552,940	365,487	241,392	4,619	507,820	66,924	1,186,057	46.5	1,366,883	1,108,186	1,073,739	577,997
Lake Terminal	Sept.	12	.....	.....	119,969	28,436	13,240	.....	54,047	3,898	99,621	83.0	20,348	13,770	14,626	20,460
	9 mos.	12	.....	.....	948,603	126,189	133,796	.....	463,463	19,716	743,164	78.3	205,439	143,577	164,718	35,008
Lehigh & Hudson River	Sept.	96	216,792	1,446	227,604	22,222	28,455	2,768	73,305	10,419	137,169	60.3	90,435	72,376	53,282	30,317
	9 mos.	96	1,821,100	11,335	1,936,324	264,543	298,418	23,875	668,420	88,283	1,343,539	69.4	592,785	463,001	304,010	340,275
Lehigh & New England	Sept.	216	552,800	811	561,279	60,657	95,282	5,223	160,846	15,878	337,862	60.2	223,417	196,746	178,249	96,932
	9 mos.	216	3,610,428	8,986	3,679,811	452,415	834,531	55,003	1,293,958	151,922	2,786,896	75.7	892,915	768,912	741,266	804,123
Lehigh Valley	Sept.	1,361	5,644,537	579,810	6,740,783	594,862	1,290,819	146,755	2,372,495	142,320	4,580,819	68.0	2,159,964	1,731,690	1,619,319	1,322,377
	9 mos.	1,361	44,430,668	5,002,908	53,878,212	4,700,412	11,275,043	1,296,382	21,179,410	1,346,846	40,087,518	74.4	13,790,694	10,855,097	9,701,969	8,200,960
Louisiana & Arkansas	Sept.	636	660,345	28,399	719,403	102,938	91,358	19,899	190,841	22,101	408,758	56.8	310,645	244,891	184,263	123,019
	9 mos.	636	5,370,134	201,092	5,811,264	989,819	858,630	208,498	1,708,452	208,890	3,948,809	68.0	1,862,455	1,380,209	968,280	647,769
Louisiana Ry. & Nav. Co. of Texas	Sept.	206	101,209	3,292	109,425	24,600	10,586	2,696	37,589	5,674	81,145	74.2	28,280	24,280	10,660	—11,486
	9 mos.	206	710,642	24,212	775,420	217,552	122,148	24,388	340,367	49,294	753,749	97.2	21,671	—37,142	—151,319	—168,220
Louisville & Nashville	Sept.	5,249	9,284,338	1,282,657	11,327,438	1,700,514	2,413,270	231,888	3,622,060	375,192	8,391,785	74.1	2,935,653	2,935,653	2,908,357	2,121,554
	9 mos.	5,249	81,272,391	12,052,062	100,010,795	16,498,597	22,911,434	2,191,545	34,618,068	3,456,609	80,109,243	80.1	19,901,552	14,183,901	14,750,609	13,242,901

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1929—CONTINUED

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1929—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1928.
Maine Central	Sept.	1,122	$1,393,745	$272,988	$1,836,655	$278,051	$352,031	$18,549	$629,791	$54,604	$1,337,987	72.8	$498,668	$387,307	$317,774	$206,693
	9 mos.	1,122	10,643,399	2,450,163	15,027,052	2,185,127	2,999,087	168,693	5,480,751	471,883	11,318,211	75.3	3,708,841	2,915,604	2,573,218	1,966,796
Midland Valley	Sept.	364	319,635	11,549	341,923	60,372	30,322	5,910	74,355	10,458	176,369	51.6	165,554	151,277	130,870	129,660
	9 mos.	364	2,445,642	105,060	2,650,489	473,973	266,930	55,171	668,561	103,954	1,540,778	58.1	1,109,711	972,215	777,256	810,067
Minneapolis & St. Louis	Sept.	1,627	1,293,961	59,255	1,431,805	185,996	247,009	35,543	515,502	44,416	1,028,919	71.9	402,886	329,523	233,544	165,549
	9 mos.	1,627	9,683,933	625,856	11,068,763	1,507,951	1,784,666	323,819	4,831,825	419,445	8,865,349	80.1	2,203,414	1,623,281	1,586,838	74,972
Minneapolis, St. Paul & S. S. Marie	Sept.	4,380	4,113,229	438,029	4,944,440	619,065	738,185	80,430	1,505,713	121,696	3,093,378	62.6	1,851,062	1,484,418	1,262,177	1,611,473
	9 mos.	4,380	29,928,856	3,689,737	36,873,083	4,977,314	6,731,023	733,715	13,040,771	1,090,166	26,788,140	72.6	10,084,943	7,771,775	6,478,597	5,304,020
Duluth, South Shore & Atlantic	Sept.	573	319,741	63,977	439,875	74,071	69,071	7,591	160,002	10,261	323,171	73.5	116,704	85,704	71,898	55,075
	9 mos.	573	3,008,536	493,165	3,844,148	686,575	633,356	69,161	1,568,576	99,383	3,076,339	80.0	767,809	484,807	336,482	254,777
Spokane International	Sept.	165	98,822	9,710	122,959	21,242	10,754	3,590	32,926	7,137	76,756	62.4	46,203	40,668	31,532	20,977
	9 mos.	165	739,747	79,341	959,073	169,593	85,841	32,479	305,866	60,073	663,316	69.2	295,757	246,490	189,224	182,210
Mississippi Central	Sept.	148	150,620	7,052	162,371	15,177	27,518	9,898	36,818	8,022	97,273	59.9	65,098	50,211	53,435	43,517
	9 mos.	157	1,138,783	58,374	1,248,211	164,516	238,512	85,911	322,494	74,177	885,264	70.9	362,947	269,354	286,457	284,441
Missouri & North Arkansas	Sept.	364	176,038	10,095	203,637	49,882	21,296	10,291	62,134	9,249	153,530	75.4	50,107	48,707	32,180	13,078
	9 mos.	364	1,239,164	92,296	1,425,166	335,767	232,980	87,342	527,237	78,855	1,263,668	88.7	161,498	138,068	19,161	—39,847
Missouri-Illinois	Sept.	202	215,288	1,839	221,528	28,569	28,668	3,705	58,674	11,578	131,194	59.2	90,334	76,806	64,059	45,887
	9 mos.	202	1,666,195	15,036	1,732,853	216,374	292,390	31,359	474,746	77,644	1,090,695	62.9	642,158	530,963	433,424	340,941
Missouri-Kansas-Texas Lines	Sept.	3,188	3,851,266	494,003	4,762,018	763,799	839,516	121,609	1,299,534	173,624	3,202,122	67.2	1,559,896	1,258,465	977,224	1,216,338
	9 mos.	3,188	33,058,616	4,740,148	41,719,868	6,080,019	7,714,919	1,132,539	12,151,732	1,541,773	28,743,216	68.9	12,976,652	10,388,299	8,433,156	8,469,632
Missouri Pacific	Sept.	7,461	10,828,463	1,101,276	12,946,883	2,318,755	1,848,900	342,192	4,073,558	379,210	8,977,135	69.3	3,969,748	3,341,932	2,711,986	2,413,505
	9 mos.	7,461	84,963,482	9,928,744	104,440,279	18,010,260	17,584,058	2,851,829	34,741,843	3,504,943	76,960,102	73.7	27,480,177	22,686,398	18,031,622	15,182,635
Gulf Coast Lines	Sept.	1,026	939,172	117,931	1,125,414	153,587	204,046	46,658	330,090	58,912	787,808	70.0	337,606	281,504	247,949	227,407
	9 mos.	1,026	9,648,323	1,169,721	11,575,073	1,943,864	2,000,976	414,784	3,273,919	548,197	8,125,959	70.2	3,449,114	2,963,543	2,323,899	2,185,309
International-Great Northern	Sept.	1,159	1,270,833	163,354	1,584,083	233,371	278,177	43,646	544,824	69,929	1,174,963	74.17	409,120	366,987	266,420	513,552
	9 mos.	1,159	10,699,464	1,542,096	13,708,427	2,169,636	2,208,672	358,202	5,358,317	641,842	10,733,052	78.30	2,975,375	2,595,711	1,654,734	1,660,821
San Antonio, Uvalde & Gulf	Sept.	318	103,880	14,971	131,194	28,741	20,968	8,218	55,887	8,449	121,935	92.9	9,259	4,809	—23,478	—2,912
	9 mos.	318	1,246,552	155,679	1,530,910	337,793	229,495	66,496	436,368	77,083	1,140,663	74.5	390,247	352,114	92,371	236,131
Mobile & Ohio	Sept.	1,159	1,356,184	90,107	1,516,414	225,007	277,343	56,452	510,209	48,761	1,117,838	73.7	398,576	305,832	267,636	319,461
	9 mos.	1,159	11,622,239	785,274	13,210,359	1,993,352	2,466,450	506,280	4,653,652	447,370	10,048,802	76.1	3,152,557	2,364,439	1,948,282	1,691,152
Monongahela	Sept.	171	570,785	8,142	583,604	80,000	75,000	1,045	145,668	10,541	311,927	53.4	271,677	249,531	147,196	184,168
	9 mos.	171	5,381,834	90,608	5,523,679	720,000	675,000	10,726	1,370,182	100,873	2,871,778	52.0	2,651,901	2,433,909	1,514,021	1,383,170
Monongahela Connecting	Sept.	6	.....	.....	221,155	18,370	35,522	301	93,560	4,385	152,138	68.8	69,017	57,150	45,206	50,964
	9 mos.	6	.....	.....	2,034,786	214,719	318,833	2,701	857,200	35,213	1,428,666	70.2	606,120	500,459	431,058	323,329
Montour	Sept.	56	227,183	.....	228,604	36,396	46,817	1,128	51,140	7,207	142,688	62.4	85,916	84,044	94,052	60,830
	9 mos.	56	1,790,834	2	1,797,918	247,421	443,483	12,038	405,866	65,207	1,169,504	65.0	628,414	613,056	706,968	490,319
Nashville, Chatt. & St. Louis	Sept.	1,222	1,567,184	227,315	1,964,839	204,971	401,113	77,826	642,722	87,980	1,423,159	72.4	541,630	446,566	468,117	461,697
	9 mos.	1,239	13,857,075	2,266,585	17,681,310	2,101,565	3,502,587	728,199	6,033,907	737,527	13,162,655	74.4	4,518,655	3,698,871	3,767,327	3,069,900
Nevada Northern	Sept.	165	79,214	5,658	99,494	13,346	5,350	977	15,687	4,896	40,406	40.6	59,088	44,694	45,059	49,721
	9 mos.	165	852,903	55,909	1,030,332	111,863	60,546	8,838	152,897	45,452	381,215	37.0	649,117	510,854	496,591	307,147
Newburgh & South Shore	Sept.	6	.....	.....	192,294	25,494	26,332	.....	68,766	6,463	127,055	66.1	65,239	47,729	39,832	14,835
	9 mos.	6	.....	.....	1,524,626	128,909	284,676	.....	610,351	55,796	1,079,732	70.8	444,894	296,727	331,243	258,462
New Orleans Great Northern	Sept.	276	267,841	18,469	296,503	34,404	54,772	14,171	80,772	14,384	198,379	66.9	98,124	78,606	53,407	54,206
	9 mos.	276	2,205,300	155,873	2,450,710	389,189	390,013	122,368	714,059	107,237	1,722,563	70.3	728,147	566,082	342,850	397,898
New Orleans Terminal	Sept.	20	1,056	.....	99,964	21,553	10,615	.....	54,787	1,711	88,666	88.7	11,298	291	—14,102	63,080
	9 mos.	20	21,767	.....	1,397,255	165,478	84,408	.....	534,191	15,437	799,514	57.2	597,741	502,765	395,586	321,117
New York Central	Sept.	6,914	20,695,731	8,696,340	34,707,948	4,957,994	7,252,401	467,698	11,389,549	957,308	25,581,518	73.7	9,126,430	6,583,178	6,593,910	6,329,179
	9 mos.	6,914	182,622,328	74,045,381	298,973,466	40,150,080	65,463,444	4,304,587	101,896,338	8,251,866	224,785,410	75.2	74,188,056	52,474,241	50,718,213	46,399,655
Cincinnati Northern	Sept.	244	324,320	3,318	338,500	42,547	58,977	5,795	96,671	10,085	214,075	63.2	124,425	95,727	96,137	83,221
	9 mos.	244	2,693,025	29,451	2,798,689	332,449	585,290	53,587	919,153	91,285	1,981,169	70.8	817,520	603,997	530,998	418,743
Cleve., Cinn., Chicago & St. Louis	Sept.	2,397	6,179,580	1,214,210	8,177,812	1,006,364	1,749,400	161,382	2,736,967	231,303	5,980,712	73.1	2,197,100	1,703,639	1,626,003	1,323,384
	9 mos.	2,397	52,630,943	10,689,386	69,515,830	7,624,223	15,212,468	1,417,028	24,838,021	2,147,448	52,003,885	74.8	17,511,945	13,335,322	12,429,166	10,047,556
Indiana Harbor Belt	Sept.	117	.....	.....	1,150,379	84,000	102,977	5,077	408,603	26,483	637,377	55.4	513,002	431,495	375,779	389,318
	9 mos.	118	.....	.....	9,694,141	924,000	990,904	45,384	3,772,399	247,980	6,090,339	62.8	3,603,802	2,983,895	2,557,978	2,389,003
Michigan Central	Sept.	1,858	5,435,817	1,690,942	8,090,941	1,014,637	1,555,892	135,483	2,434,934	175,720	5,438,927	67.2	2,652,014	2,107,973	2,058,610	2,218,992
	9 mos.	1,858	50,430,186	15,183,057	73,311,501	7,686,213	15,121,961	1,229,859	22,615,209	1,553,002	49,181,121	67.1	24,130,380	19,080,780	17,847,264	17,076,742
Pittsburgh & Lake Erie	Sept.	231	2,579,740	182,527	2,863,365	359,109	887,147	24,745	905,126	87,329	2,274,907	79.4	588,458	403,481	780,766	651,964
	9 mos.	231	23,405,987	1,690,282	26,162,958	3,067,399	9,138,011	259,820	8,240,576	715,530	21,512,826	82.2	4,650,132	3,029,487	6,203,729	5,482,835
New York, Chicago & St. Louis	Sept.	1,690	4,741,915	176,822	5,076,452	636,766	903,554	139,671	1,578,689	132,628	3,370,302	66.4	1,706,150	1,421,871	1,171,796	1,161,261
	9 mos.	1,690	40,040,129	1,510,470	43,108,889	5,258,093	8,208,376	978,365	14,444,880	1,178,471	29,952,459	69.5	13,156,430	10,716,791	8,599,667	6,507,789

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1929—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1928.
N. Y., New Haven & Hartford	Sept.	2,131	$6,890,759	$4,136,106	$12,386,597	$1,836,084	$1,879,990	$107,973	$3,634,556	$333,612	$7,981,534	64.4	$4,405,063	$3,762,625	$3,209,739	$2,971,245
	9 mos.	2,130	58,033,586	34,964,504	104,249,765	14,694,736	17,633,947	948,589	32,158,765	3,002,544	70,012,607	67.2	34,237,158	28,145,940	23,423,116	19,212,147
New York Connecting	Sept.	20	229,192	.....	272,326	26,557	11,638	.....	38,267	2,028	78,530	28.8	193,796	158,096	137,283	87,161
	9 mos.	20	1,918,320	.....	2,218,145	372,159	84,217	.....	335,233	16,225	807,834	36.4	1,410,311	1,078,611	860,252	724,067
New York, Ontario & Western	Sept.	568	775,133	182,027	1,114,242	167,819	199,640	20,672	461,346	36,302	886,987	79.6	227,255	182,250	122,910	117,971
	9 mos.	568	6,217,366	1,765,795	9,483,615	1,339,402	1,757,731	177,689	4,057,985	310,000	7,665,046	80.8	1,818,569	1,413,253	900,987	823,689
Norfolk & Western	Sept.	2,239	9,556,707	453,724	10,415,033	1,221,761	1,686,955	119,677	2,185,683	245,246	5,468,542	52.5	4,946,491	3,996,315	4,223,137	3,386,589
	9 mos.	2,240	79,800,181	3,880,841	86,569,997	10,695,364	15,830,805	1,073,661	19,689,954	2,178,121	49,543,184	57.2	37,026,813	29,468,983	31,610,926	22,766,992
Norfolk Southern	Sept.	931	567,624	38,069	655,496	97,840	87,437	27,313	244,798	26,853	483,726	73.8	171,770	120,697	115,591	55,405
	9 mos.	931	5,458,364	314,760	6,243,008	867,296	885,451	247,578	2,375,455	258,137	4,617,009	74.0	1,625,999	1,164,873	998,384	1,189,327
Northern Pacific	Sept.	6,792	8,149,946	865,450	9,935,206	839,025	1,495,793	203,006	2,801,348	249,778	5,739,841	57.8	4,195,365	3,195,317	3,518,420	3,606,663
	9 mos.	6,792	57,114,947	7,686,664	72,115,359	10,039,288	13,970,357	2,117,361	24,248,029	2,336,110	53,796,982	74.6	18,318,377	11,689,197	15,065,546	15,064,291
Northwestern Pacific	Sept.	477	400,436	150,236	599,699	109,212	79,648	7,421	233,031	24,386	453,698	75.7	146,001	109,436	100,287	116,972
	9 mos.	477	2,848,961	1,335,044	4,649,603	899,796	794,135	69,344	2,075,875	163,778	3,997,698	86.0	651,905	312,508	279,612	218,203
Pennsylvania R. R.	Sept.	10,498	42,703,233	11,661,705	60,805,182	7,984,984	10,886,564	892,611	19,876,327	1,667,431	41,929,136	69.0	18,876,046	14,248,151	13,138,323	11,931,115
	9 mos.	10,498	364,288,567	98,095,636	514,071,694	64,799,180	98,531,263	8,105,123	174,130,937	14,624,926	366,050,711	71.2	148,020,983	115,521,943	103,733,713	83,759,530
Long Island	Sept.	404	961,244	2,620,558	3,783,730	440,886	414,242	20,457	1,299,245	64,681	2,240,102	59.2	1,543,628	1,127,792	955,575	928,807
	9 mos.	404	8,357,186	21,541,169	31,552,785	3,755,044	4,239,215	190,506	11,653,921	573,598	20,420,266	64.7	11,132,519	8,639,180	7,206,705	5,769,998
West Jersey & Seashore	Sept.	370	505,442	532,170	1,091,789	149,523	129,917	6,869	399,856	19,342	707,297	64.8	384,492	223,077	173,086	191,572
	9 mos.	370	3,896,753	3,989,460	8,277,931	1,068,161	1,026,695	52,761	3,189,046	154,077	5,509,100	66.6	2,768,831	1,754,744	1,493,589	692,868
Peoria & Pekin Union	Sept.	19	20,492	1,514	166,733	23,155	9,927	6,364	64,482	7,057	110,985	66.5	55,748	41,998	60,808	53,958
	9 mos.	19	175,790	13,684	1,359,192	162,848	117,347	49,839	571,802	75,665	977,501	71.9	381,691	243,087	395,585	505,568
Pere Marquette	Sept.	2,241	3,875,857	245,871	4,444,232	595,459	992,691	68,637	1,371,120	123,065	3,147,140	70.8	1,297,092	1,010,468	857,029	1,274,071
	9 mos.	2,241	32,149,970	2,375,282	37,001,369	4,265,077	7,330,558	596,892	11,836,731	1,119,555	25,097,647	67.8	11,903,722	9,562,853	8,224,911	7,377,852
Pittsburgh & Shawmut	Sept.	102	101,811	2,500	106,005	20,235	29,422	1,461	32,135	6,517	89,770	84.7	16,235	14,927	21,153	29,128
	9 mos.	102	1,097,546	29,291	1,146,271	180,408	289,024	15,396	338,550	72,567	895,945	78.2	250,326	238,195	270,484	405,816
Pittsburgh & West Virginia	Sept.	92	332,034	3,800	367,197	43,934	86,345	18,216	64,421	28,603	250,908	68.3	116,289	85,644	173,590	240,092
	9 mos.	92	3,437,398	36,929	3,762,941	304,528	742,580	156,605	658,219	218,777	2,174,632	57.8	1,588,309	1,170,815	1,874,583	1,619,061
Pittsburgh, Shawmut & Northern	Sept.	198	142,469	852	147,659	52,491	25,305	1,625	46,458	6,286	132,165	89.5	15,494	12,482	4,345	30,619
	9 mos.	198	1,276,779	11,152	1,326,932	311,293	250,165	14,917	419,160	56,780	1,052,315	79.3	274,617	247,650	176,659	238,458
Quincy, Omaha & Kansas City	Sept.	249	72,395	7,180	87,843	22,128	5,661	744	28,322	2,344	59,148	67.3	28,695	23,838	20,251	36,417
	9 mos.	249	418,597	80,551	562,084	218,673	78,668	7,011	247,253	24,227	574,863	102.3	—12,779	—56,489	—79,599	—167,215
Reading	Sept.	1,459	7,151,992	585,618	8,239,929	1,125,178	1,767,057	110,033	2,862,220	211,092	6,102,295	74.1	2,137,634	1,692,369	1,734,965	1,598,665
	9 mos.	1,459	61,404,300	5,309,551	71,905,016	10,561,707	16,519,241	845,426	26,516,906	1,986,770	56,690,135	78.8	15,214,881	11,896,474	12,045,786	10,959,869
Atlantic City	Sept.	163	150,031	211,858	394,618	85,449	21,640	4,070	197,411	4,160	312,894	79.3	81,724	42,174	21,804	—4,178
	9 mos.	163	1,150,776	1,847,053	3,229,777	565,769	217,580	41,518	1,678,013	43,717	2,548,078	78.9	681,699	321,225	87,174	—362,583
Richmond, Fredericksburg & Potomac	Sept.	117	349,800	271,102	777,674	80,271	154,121	10,417	269,546	38,486	566,388	72.8	211,286	160,876	144,325	132,947
	9 mos.	117	4,719,883	2,849,953	9,155,246	1,157,733	1,502,401	89,114	2,986,760	330,800	6,253,258	68.3	2,901,988	2,358,447	1,912,283	1,362,347
Rutland	Sept.	413	308,108	108,850	590,024	99,512	89,518	10,607	184,755	15,964	402,471	68.2	187,553	147,920	153,696	90,098
	9 mos.	413	2,670,329	792,068	4,724,135	861,737	893,122	97,759	1,750,120	151,155	3,770,988	79.8	953,147	692,696	763,345	753,004
St. Louis-San Francisco	Sept.	5,304	6,351,042	917,181	7,823,119	1,047,923	1,444,747	135,960	2,324,765	230,843	5,132,969	65.6	2,690,150	2,268,178	2,266,187	2,101,779
	9 mos.	5,304	49,801,679	8,054,738	63,453,673	8,495,609	12,691,568	1,192,518	20,484,455	2,108,863	44,430,890	70.0	19,022,783	15,114,651	15,586,168	14,710,378
Ft. Worth & Rio Grande	Sept.	233	87,676	6,258	104,982	41,711	18,250	3,379	41,629	5,096	110,064	104.8	—5,082	—9,348	—19,035	7,952
	9 mos.	233	733,853	65,527	923,602	285,324	162,362	30,995	393,244	47,429	918,022	99.4	5,580	—34,685	—112,161	—111,945
St. Louis, San Francisco & Texas	Sept.	154	168,607	11,229	188,139	30,759	25,928	5,566	56,737	8,051	126,917	67.5	61,222	59,078	32,309	32,412
	9 mos.	154	1,275,308	100,420	1,448,771	259,990	233,663	49,194	509,980	69,878	1,121,317	77.4	327,454	300,989	52,099	33,044
St. Louis Southwestern	Sept.	950	1,435,123	65,868	1,571,567	192,864	221,006	68,328	357,944	68,550	920,257	58.6	651,310	545,720	442,337	344,713
	9 mos.	940	12,407,016	562,538	13,686,549	1,525,820	2,011,715	637,155	3,473,634	599,666	8,342,735	61.0	5,343,814	4,722,716	3,569,543	2,922,377
St. Louis Southwestern of Texas	Sept.	807	666,925	36,807	766,757	234,118	127,579	28,636	251,210	35,310	690,589	90.1	76,168	48,474	80,605	158,364
	9 mos.	807	4,753,910	328,684	5,707,661	2,366,225	1,160,289	266,099	2,532,005	317,302	6,722,570	117.8	—1,014,909	—1,266,197	—1,038,723	—290,986
San Diego & Arizona	Sept.	156	57,433	13,333	76,495	23,994	22,289	3,610	23,005	9,276	83,447	109.1	—6,952	—12,316	—11,732	—1,552
	9 mos.	156	799,058	158,707	994,466	172,862	159,011	36,590	254,537	76,829	712,309	71.6	282,157	230,717	232,505	172,096
Seaboard Air Line	Sept.	4,490	3,107,168	437,700	4,199,317	545,195	763,504	189,777	1,453,133	178,767	3,134,913	74.7	1,064,404	761,974	796,730	483,047
	9 mos.	4,490	34,221,697	5,534,635	44,455,915	5,407,946	7,692,817	1,790,342	15,368,761	1,588,084	32,310,143	72.7	12,145,772	9,237,355	8,479,182	7,191,592
Southern Ry.	Sept.	6,730	9,227,037	1,893,431	12,091,974	1,857,613	2,132,128	237,869	3,757,678	377,090	8,435,713	69.8	3,656,261	2,767,215	2,729,489	2,650,791
	9 mos.	6,730	80,752,307	16,803,304	107,717,677	16,285,627	19,366,145	2,198,500	34,988,795	3,397,199	76,885,503	71.4	30,832,174	23,589,022	22,891,063	21,026,524
Alabama Great Southern	Sept.	314	760,589	131,750	944,349	152,161	182,041	20,334	238,691	23,170	623,411	65.0	320,938	245,536	269,743	245,566
	9 mos.	314	6,001,086	1,223,344	7,869,628	1,333,372	1,567,881	192,372	2,188,018	220,111	5,562,463	70.7	2,307,165	1,689,081	1,916,548	1,642,925
Cinn., New Orleans & Texas Pacific	Sept.	338	1,575,312	223,658	1,898,097	345,335	408,692	43,086	488,843	52,279	1,344,863	70.9	553,234	438,672	452,167	475,561
	9 mos.	338	13,882,184	2,322,163	17,363,314	4,075,581	3,751,923	395,978	4,680,280	481,758	13,487,784	77.7	3,875,530	3,034,964	2,880,729	3,704,865

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1929—CONTINUED

Name of road		Av. mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1928.
Cinn., New Orleans & Texas Pacific	Sept.	338	2,322,163	17,363,314	4,075,581	3,751,923	395,978	4,680,280	481,758	13,487,784	77.7	3,875,530	3,034,964	2,880,729	3,704,883
	9 mos.	338	13,882,184												
Georgia Southern & Florida	Sept.	397	$220,083	$61,095	$305,308	$74,372	$79,991	$1,651	$113,401	$3,138	$276,492	90.6	$28,816	$5,563	$19,521	$29,776
	9 mos.	397	2,100,293	825,864	3,282,341	667,933	743,678	34,699	1,211,300	44,211	2,753,730	83.9	528,611	317,820	360,894	99,591
New Orleans & Northeastern	Sept.	204	429,293	59,099	517,679	72,729	83,013	10,902	134,571	14,849	320,079	61.8	197,600	141,386	91,248	60,318
	9 mos.	204	3,315,056	576,991	4,261,722	569,967	750,926	104,495	1,189,190	134,936	2,784,532	65.3	1,477,190	1,039,084	687,969	581,193
Northern Alabama	Sept.	110	83,511	4,812	91,516	29,323	3,228	1,810	29,945	2,787	67,087	73.3	24,429	18,444	—1,203	7,713
	9 mos.	110	816,177	48,273	901,792	200,437	31,699	19,011	271,845	24,952	548,013	60.8	353,779	290,288	123,918	752
Southern Pacific	Sept.	9,076	15,266,088	3,348,129	20,384,021	2,368,306	2,930,896	401,142	6,324,382	652,687	12,895,294	63.3	7,488,727	5,780,457	5,025,852	5,196,517
	9 mos.	8,905	123,346,109	30,258,564	169,904,480	20,867,481	27,101,532	3,866,231	54,020,152	5,943,867	114,898,672	67.6	55,005,808	40,972,865	36,921,918	33,072,097
So. Pacific Steamship Lines	Sept.	....	768,873	80,508	903,581	8,690	381,446	17,534	546,207	33,498	987,375	109.3	—83,788	—79,009	—76,665	108,001
	9 mos.	....	6,833,024	512,566	8,290,142	197,328	2,580,787	178,793	5,124,518	314,861	8,396,297	101.3	—106,155	—120,603	—95,436	597,424
Texas & New Orleans	Sept.	4,729	5,108,847	832,033	6,502,220	970,641	1,151,047	183,521	1,903,290	254,199	4,460,232	68.6	2,041,988	1,639,501	1,330,060	1,466,183
	9 mos.	4,729	43,013,850	7,876,144	55,417,676	8,597,219	10,867,230	1,605,827	17,770,778	2,346,128	41,274,172	74.5	14,143,504	10,927,267	8,309,793	5,428,587
Spokane, Portland & Seattle	Sept.	554	768,634	105,286	942,971	126,053	108,483	15,584	253,175	23,632	533,422	56.6	409,549	323,021	286,630	255,580
	9 mos.	554	5,622,021	835,453	7,137,479	1,029,603	929,285	111,419	2,095,848	215,587	4,433,505	62.1	2,703,974	1,932,263	1,773,285	1,638,745
Tennessee Central	Sept.	296	274,235	15,591	309,509	44,260	42,378	8,869	98,012	13,029	201,917	65.2	107,592	93,948	70,796	54,904
	9 mos.	296	2,212,055	147,051	2,517,276	444,492	382,714	78,439	876,252	119,435	1,885,516	74.9	631,760	558,149	389,895	297,984
Terminal R. R. Assn. of St. L.	Sept.	55	.....	.....	1,099,155	220,044	96,733	2,850	424,377	28,684	775,807	70.6	323,348	215,474	305,536	388,129
	9 mos.	55	.....	.....	9,653,754	1,421,051	767,360	24,721	4,173,470	243,838	6,659,676	69.0	2,994,078	2,056,926	2,853,212	2,981,707
Texas & Pacific	Sept.	1,954	2,879,207	446,364	3,560,715	648,825	600,742	92,380	1,044,867	120,830	2,515,248	70.6	1,045,467	853,825	691,719	842,495
	9 mos.	2,008	27,773,987	4,095,404	34,412,243	5,425,237	5,859,664	827,209	10,670,178	1,113,023	23,917,672	69.5	10,494,571	8,722,923	6,430,264	7,143,583
Texas Mexican	Sept.	162	98,558	5,261	114,364	19,640	19,213	4,263	40,296	7,669	89,629	78.4	24,735	19,735	7,898	5,302
	9 mos.	162	931,025	31,575	1,073,443	175,837	172,908	37,180	389,281	71,034	838,940	78.2	234,503	189,083	115,874	135,001
Toledo, Peoria & Western	Sept.	239	204,289	459	210,005	41,709	28,121	13,110	66,404	9,462	158,806	75.6	51,199	45,666	28,482	40,734
	9 mos.	239	1,712,173	5,743	1,775,879	232,838	218,036	107,065	583,237	82,203	1,223,379	68.9	552,500	483,004	377,673	202,234
Toledo Terminal	Sept.	28	.....	.....	135,550	10,221	18,173	666	55,842	4,885	89,361	65.9	46,189	29,518	36,775	64,400
	9 mos.	28	.....	.....	1,231,972	103,109	159,772	5,306	506,960	49,387	821,508	66.7	410,464	265,640	454,950	497,894
Trinity & Brazos Valley	Sept.	367	229,166	7,665	262,647	59,046	31,540	6,180	80,372	13,270	188,216	71.7	74,431	66,666	17,613	38,649
	9 mos.	367	1,818,256	60,592	1,967,442	503,252	313,874	50,286	727,855	108,902	1,692,147	86.0	275,295	205,146	—91,325	—60,949
Ulster & Delaware	Sept.	128	39,367	17,804	92,068	15,491	16,402	1,303	46,928	4,127	84,251	91.5	7,817	1,313	—2,651	4,935
	9 mos.	128	320,306	213,798	884,000	145,819	140,591	12,630	408,760	37,070	745,870	84.4	138,130	83,326	51,911	83,094
Union R. R. of Penna.	Sept.	45	.....	.....	1,035,217	81,283	181,084	166	363,733	14,218	640,484	61.9	394,733	324,033	398,704	367,630
	9 mos.	45	.....	.....	8,614,421	831,782	1,633,446	1,605	3,248,853	129,669	5,843,540	67.8	2,770,881	2,439,954	3,092,371	2,306,110
Union Pacific	Sept.	3,765	9,983,215	1,411,322	12,339,986	1,351,403	2,159,313	178,859	3,141,881	348,507	7,407,203	60.0	4,932,783	4,112,670	3,435,277	4,963,810
	9 mos.	3,765	68,850,127	11,640,696	88,326,143	10,971,620	18,027,760	1,716,849	23,891,477	3,080,621	59,491,964	67.4	28,834,179	22,061,916	19,826,915	20,327,215
Oregon Short Line	Sept.	2,538	3,369,516	339,250	3,998,326	444,091	471,575	55,901	1,042,581	133,488	2,239,501	56.0	1,758,825	1,322,252	1,161,875	1,665,712
	9 mos.	2,538	23,171,115	3,076,022	28,527,202	4,686,751	4,196,817	513,783	8,165,987	1,188,047	19,399,729	68.0	9,127,473	6,257,204	5,467,999	5,185,236
Oregon-Wash. R. R. & Nav. Co.	Sept.	2,365	2,301,721	253,862	2,785,243	396,779	337,464	77,988	960,683	135,948	1,932,861	69.4	852,382	651,142	471,485	568,613
	9 mos.	2,365	17,450,334	2,324,715	21,823,933	3,947,812	3,359,554	717,196	8,003,312	1,206,638	1,745,257	80.0	4,365,676	2,566,691	1,341,848	884,034
Los Angeles & Salt Lake	Sept.	1,210	1,669,460	439,860	2,342,349	390,744	358,558	77,022	692,167	90,742	1,703,681	72.7	638,668	462,970	323,930	387,689
	9 mos.	1,209	15,101,848	3,694,362	20,685,127	3,249,308	3,377,783	747,388	6,020,317	777,073	14,971,301	72.4	5,713,826	4,349,814	3,319,826	1,294,129
St. Joseph & Grand Island	Sept.	258	365,343	8,790	385,574	63,003	44,775	3,504	123,594	15,833	250,709	65.0	134,865	112,696	73,299	62,810
	9 mos.	258	2,616,183	96,735	2,885,788	468,372	393,988	30,004	972,028	143,797	2,008,189	69.6	877,599	698,638	497,375	502,399
Utah	Sept.	111	181,130	.....	181,197	22,061	40,526	371	35,396	4,817	103,171	56.9	78,026	60,846	52,933	28,487
	9 mos.	111	1,395,818	.....	1,399,497	200,623	324,908	3,296	304,322	46,922	880,071	62.9	519,426	415,298	367,365	144,303
Virginian	Sept.	545	1,491,759	24,458	1,600,719	164,301	308,721	13,485	328,171	32,455	845,300	52.8	755,419	592,418	679,003	698,086
	9 mos.	545	13,624,171	258,738	14,625,110	1,536,000	2,616,068	126,957	2,902,468	294,301	7,458,765	51.0	7,166,345	5,640,316	6,318,533	4,896,587
Wabash	Sept.	2,523	5,763,775	571,461	6,848,359	908,739	1,133,602	181,276	2,318,954	239,768	4,806,516	70.2	2,041,843	1,771,396	1,468,230	1,229,250
	9 mos.	2,523	48,869,368	5,366,656	58,569,245	8,189,749	9,901,213	1,633,399	20,920,821	1,965,815	42,821,154	73.1	15,748,091	13,144,184	10,238,917	7,750,699
Ann Arbor	Sept.	293	504,150	15,168	541,864	75,478	110,628	14,502	191,426	13,438	405,021	74.7	136,843	109,376	91,138	63,241
	9 mos.	293	4,389,385	147,103	4,752,400	547,665	978,408	131,435	1,766,436	112,419	3,507,314	73.8	1,245,086	1,000,854	771,392	645,986
Western Maryland	Sept.	874	1,574,484	26,324	1,660,210	259,859	281,270	40,015	399,585	38,975	1,028,435	61.9	631,775	531,775	605,544	529,168
	9 mos.	874	13,148,582	256,290	13,930,576	2,308,327	2,668,216	382,592	3,691,436	377,646	9,459,712	67.9	4,470,864	3,710,864	4,098,706	3,731,954
Western Pacific	Sept.	1,051	1,562,116	131,179	1,888,426	253,627	270,110	83,364	552,975	61,256	1,319,802	70.0	568,624	435,305	443,915	606,074
	9 mos.	1,051	10,812,703	1,160,448	12,987,240	2,514,868	2,448,470	652,814	4,453,531	448,371	10,834,320	83.4	2,152,920	1,190,386	1,628,173	1,009,343
Wheeling & Lake Erie	Sept.	511	1,738,215	18,808	1,872,168	240,180	437,532	39,594	501,194	48,420	1,265,869	67.6	606,299	468,961	486,171	500,539
	9 mos.	511	15,608,732	196,277	16,850,415	1,996,600	3,891,001	339,231	4,566,520	432,754	11,226,394	66.7	5,624,021	4,322,343	4,259,432	3,620,074
Wichita Falls & Southern	Sept.	203	92,310	2,123	101,183	16,571	11,499	2,701	29,713	3,751	64,235	63.48	36,948	31,422	19,540	22,988
	9 mos.	176	743,922	14,461	812,072	136,357	99,206	23,697	240,219	38,862	538,320	66.29	273,752	223,717	174,430	166,467

Revenues and Expenses of Railways

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1929—CONTINUED

News of the Week

(*Continued from page 1111*)

$360,267 in the 1928 period to $444,074 during the first half of 1929.

Canada was the largest buyer of all three classes of equipment, with total purchases amounting to $1,103,413. Exports to the Argentine Republic, amounting to $474,447, were second in value. Other countries buying more than $100,000 worth of the three types of equipment were, in order, Brazil, Cuba, Kwangtung (China), Japan, Great Britain, Mexico, Australia and Colombia.

Free Transportation of Private Cars Prohibited

The Interstate Commerce Commission on November 4 issued a formal order directed to the railroads members of the Association of Railway Executives requiring them to cease and desist, on or before January 15, 1930, and thereafter to abstain, from the transportation or movement of private passenger train cars, including so-called office cars, of another carrier free or at other than published tariff rates.

The order refers to the report recently promulgated by the commission, following an investigation of the use of private cars, in which the commission expressed its conclusions but declared that no order appeared to be necessary. On further and subsequent consideration, however, it says, the commission is of opinion that an order in the premises is proper and appropriate, and the exceptants to the proposed report which preceded the final repor have appeared before the commission and expressly waived any further hearing. The order is therefore directed to the roads named in the list of member roads of the Association of Railway Executives, which is attached to the order, on behalf of which exceptions to the proposed report were filed and argument heard and on whose behalf a waiver of hearing has been expressly made.

Heavy Damages for Derailing a Train

A railroad crossing wreck which occurred at Statham, Ga., last year (February 4, 1928) has been made the subject of four law suits (none of the four as yet finally settled) and the case is made notable by the fact that in one suit a jury has awarded damages of $13,500 against the owner of the oil tank truck, the presence of which on the crossing was what precipitated the disaster.

The train was passenger, No. 5, of the Seaboard Air Line, and the oil truck was wrecked and the train derailed. The driver of the truck was killed and the locomotive engineman fatally injured. Suit was brought against the railroad company for damages for the death and injuries of the truck driver and his brother, who was with him; and the railroad company has instituted suit against G. S. Bunch, owner of the truck, but none of these suits is as yet settled. The fourth suit is by the widow of the engineman, H. A. McLesky, and this suit, in the city court of Decatur, Ga., has been decided (September 19), with a verdict for damages as above stated; though the defendant has made a motion for a new trial.

The accident occurred in broad daylight and the reports indicate that it was due solely to the gross carelessness of the truck driver and his companion. For four miles before reaching the crossing, in the direction from which both train and truck approached it, the highway and the railway run parallel.

E. W. Beatty on Canada's Railway Problems

President E. W. Beatty, of the Canadian Pacific, speaking at a recent dinner given in his honor at St. Catherines, Ont., by the Chamber of Commerce of that city, said, on the question of freight rates:—

"The railway service in Canada equals, if it does not exceed, in safety, efficiency and comfort, that of the wealthies nation in the world to the south of us. If we can make this statement of comparative effectiveness honestly, as I think we can then we should be able to say that our operations are carried on under at least as favorable conditions as the railways in the United States.

"Unfortunately," announced Mr. Beatty, "we cannot say that we receive the same rewards, that we do the same business, or that we can do it at the same cost. The average rate per ton mile in Canada is about 5½ per cent lower than in the United States. The average of our grain rates is 40 per cent lower than those in the United States. The United States has 115,000,000 to 130,000,000 people; Canada has between nine and ten millions, consequently, the population per mile of railway is 478 in the United States and 241 in Canada.

"The density and the diversity of traffic in the United States is much greater than in Canada, and again as a natural result of this condition the average net earnings of railways in the United States in 1928 was almost two and a half times per mile those of Canadian railways. The anomalous condition in which we find ourselves is that, notwithstanding the considerations I have mentioned to you, and, notwithstanding that in spite of distances, sparse population, difficult operating and climatic conditions, higher costs and smaller traffic, Canadian railway rates, generally speaking, the lowest in the world, the effort to gradually whittle the revenues of the companies through rate agitations still continues.

"As I have said, this is a psychology that is difficult at times to appreciate," stated Mr. Beatty. "National considerations and considerations of transportation efficiency and industrial prosperity, seem to require that our railways should be prosperous. They have improved their position until recent months, largely because Canada is more prosperous and their own efficiency is greater, but they never at any time reached the point at which their revenues can be said to be excessive, or even adequate. The figures of the National Railways you are familiar with and the earnings of the Canadian Pacific during 1928, the best yet in its history, were only sufficient to give a return of 5.07 per cent on the cash invested in its railway properties. If these properties were valued in accordance with the method adopted in the United States, the earnings would not be more than 4 per cent of such valuation. In the result, therefore, when necessary expenses, interest and other charges and dividends are paid, the amount left for the improvement and betterment of the property is very small indeed, even in the case of the Canadian Pacific, the most prosperous of Canadian transportation companies.

"In Canada, however, there is a phase of transportation activity which does not exist to the same extent in older and more densely populated countires," said Mr. Beatty, "that is the part the companies must play in new development, as the inevitable construction of branch lines and extensions into new territory, in some cases many years before traffic sufficient to support them can be developed.

"Forty-four per cent of the railway mileage of this country is still in private hands. These companies have no open sesame to the public treasury, and they must earn returns on every dollar they borrow lest their credit be prejudiced, if not destroyed. Because of their size, the companies are often thought to be able to raise unlimited amounts of money, and easily bear all the risks incident to the assumption of these enormous obligations. That, however, is not the case."

Calendar Reform Proposals Defeated

Proposals for calendar reform failed to receive the necessary two-thirds majority vote in a nation-wide referendum of business organizations included in the membership of the Chamber of Commerce of the United States. A preliminary canvass of the balloting shows that each of the three proposals put forward received a majority of the votes cast, but since the National Chamber can be committed only by a two-thirds majority no decision was reached on any of the propositions.

The proposals submitted and the vote on each follows:

That the present calendar should be so changed as to bring about a greater comparability in business records for periods within a year and for periods from year to year.—For; 1549, against; 1318, necessary to carry, 1912.

That the form which changes in the calendar should take should be determined through international conference.—For; 1783, against; 1082, necessary to carry, 1910.

That the government of the United States should participate in an international conference to determine the form of changes to be made in the calendar.—

For; 1856, against; 1009, neccessary to carry; 1911.

The proposals submitted to referendum were recommendations contained in a report prepared by a special committee of the Chamber. The report was accompanied by a minority finding advocating continuance of the present calendar. The report of the Chamber's committee emphasized especially inconveniences in business accounting arising from the fact that months, quarters and half years are of unequal length, quoting at length from a report made to the League of Nations by a special committee.

The committee reporting to the League of Nations went over about 200 plans for changing the calendar and recommended that attention should be centered on three fundamental questions: (1) Should the divisions of the year in the present calendar be so changed that there will be greater uniformity in length and consequently better comparability? (2) Should the weeks be fixed in their relation to the divisions of the year in which they occur? (3) How should the form of the changes be determined?

Revenues and Expenses in September

Class I railroads in the first nine months this year had a net railway operating income of $960,078,699, which was at the annual rate of return of 5.29 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In the first nine months of 1928, the net was $820,572,952, or 4.59 per cent.

Operating revenues for nine months totaled $4,775,112,966, compared with $4,541,847,582 for the same period last year, an increase of 5.1 per cent. Operating expenses amounted to $3,414,375,652, an increase of 2 per cent.

Taxes in the nine months amounted to $310,914,371, compared with $286,695,003 for the same period the year before. For September, the tax bill amounted to $38,635,478, an increase of $2,848,869.

Twelve Class I railroads operated at a loss in the first nine months of 1929, of which 5 were in the Eastern district, 3 in the Southern and 4 in the Western.

Net railway operating income by districts for the first nine months with the percentage of return on an annual basis was as follows:

		P.c.
New England Region	$39,670,223	5.91
Great Lakes Region	166,943,031	5.11
Central Eastern Region	223,907,731	5.73
Pocahontas Region	67,825,977	9.38
Total Eastern District	$498,346,962	5.81
Total Southern District	$100,906,147	4.24
Northwestern Region	$111,322,179	4.83
Central Western Region	172,984,548	5.30
Southwestern Region	76,518,863	4.72
Total Western District	$360,825,590	5.02
United States	$960,078,699	5.29

For September the net operating income was $133,898,013 at the annual rate of 4.35 per cent on property investment. In September last year the net was $134,491,318 or 4.43 per cent. Operating revenues for September amounted to $566,719,559, compared with $556,915,839 in September last year or an increase of 1.8 per cent. Operating expenses totaled $383,349,139, compared with $376,241,043 for the same month in 1928, or an increase of 1.9 per cent.

Class I railroads in the Eastern district for nine months had a net of $498,346,962, at the rate of 5.81 per cent. For the same period in 1928, their net was $415,747,813, or 4.92 per cent. Operating revenues for nine months totaled $2,386,395,002, an increase of 6.5 per cent, while operating expenses totaled $1,696,926,379, an increase of 3 per cent. Class I railroads in the Eastern District for September had a net of $65,056,158 compared with $61,894,941 in September, 1928.

In the Southern District Class I railroads for nine months had a net of $100,906,147, at the annual rate of 4.24 per cent. For the same period in 1928, their net amounted to $92,245,070, which was at the rate of 3.94 per cent. Operating revenues in the Southern district for nine months amounted to $581,936,016, an increase of 1.5 per cent, while operating expenses totaled $437,581,856, a decrease of three-tenths of one per cent. The net in September amounted to $12,416,131, while in the same month in 1928 it was $10,999,983.

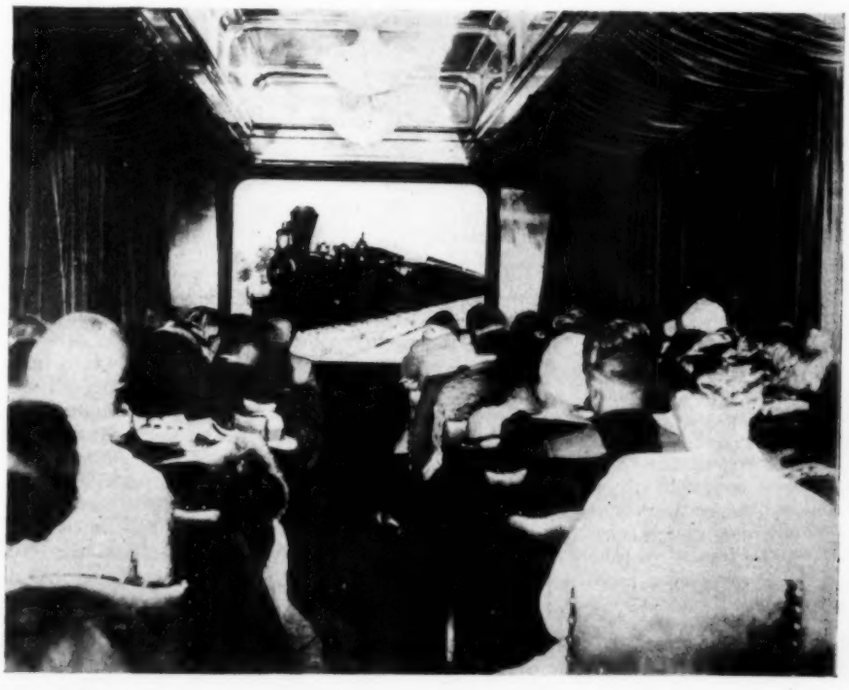
Class I railroads in the Western district for nine months had a net of $360,825,590, at the annual rate of 5.02 per cent. For the first nine months in 1928, they had a net of $312,580,069, which was at the rate of return of 4.41 per cent. Operating revenues in the Western district for nine months amounted to $1,806,781,948, an increase of 4.6 per cent over the same period last year, while operating expenses totaled $1,279,867,417, an increase of 1.6 per cent. For September, the net in the Western district amounted to $56,425,724. The net railway operating income of the same roads in September, 1928 totaled $61,596,394.

CLASS I RAILROADS—UNITED STATES

	1929	1928
Month of September		
Total operating revenues	$566,719,559	$556,915,839
Total operating expenses	383,349,139	376,241,043
Taxes	38,635,478	35,786,609
Net railway operating income	133,898,013	134,491,318
Operating ratio—per cent	67.64	67.56
Rate of return on property investment, p.c.	4.35	4.43
Nine months ended September 30		
Total operating revenues	$4,775,112,966	$4,541,847,582
Total operating expenses	3,414,375,652	3,346,368,629
Taxes	310,914,371	286,695,003
Net railway operating income	960,078,699	820,572,952
Operating ratio—per cent	71.50	73.68
Rate of return on property investment, p.c.	5.29	4.59

"Talkie" Tried on Passenger Train

An experiment to test the practicability of sound motion pictures was conducted on the Union Pacific's Los Angeles Limited enroute from Los Angeles to Chicago on October 25. Shortly after 8 p. m. (Pacific time), all passengers were invited to adjourn to a dining car, which had been fitted up for the occasion by the Paramount-Famous-Lasky Corporation and the Electrical Research Products, Inc., to review the showing of a sound news reel and a preview of the "Virginian" which will be released soon. The car was operated from Los Angeles to Las Vegas, where it was picked up by the Gold Coast Limited, on which the performance was repeated on October 26.



Wide World

"Talkies" on the Union Pacific

Foreign Railways

New Trains on Southern of Great Britain

The Southern of Great Britain, on October 14, placed in service three new passenger trains on its line between London and Hastings. The equipment of these trains is specially constructed to operate over this line which includes six tunnels with insufficient clearances for the operation of standard coaches. The new rolling stock was constructed in the company's shops at Lancing and Eastleigh where it is planned to construct other cars for use in two additional trains soon to be introduced on this line.

British Wage Reductions to be Continued Temporarily

As a result of conferences between representatives of the four British railway companies and three of the railway trade unions the wage negotiations which have been in progress for some weeks have been concluded. The present negotiations began with a proposal by the unions to cancel the 2½ per cent reduction in wages which was accepted voluntarily by railway employees in August, 1928. The settlement reached provides that this reduction shall continue in effect for a further period of six months, after which the former rates shall be restored upon the condition that no application for any additional general revision of wages shall be made by either the management or the employees before November, 1930. Since the railway managements wished to have the reduction continued for a full year while the men wanted it abolished at once the agreement reached is in the nature of a compromise.

The provisional settlement requires, before taking full effect, the approval of the railway directorates and of the three unions—the National Union of Railwaymen, the Associated Society of Locomotive Engineers and Firemen and the Railway Clerks' Association. It must also have the approval of the railway shopmen, who were not represented at the formal conferences. There is, however, little doubt but that the settlement will be approved, as the only alternative is an application to the Wages Board.

Swiss Railways Successful

Gross revenues of the Swiss Federal Railways for 1928 totaled 420,100,000 Swiss francs, or approximately $84,020,000, while operating expenses amounted to 268,500,000 francs, or about $53,700,000, leaving an operating profit for the year equivalent to $30,320,000. This surplus exceeded that for 1927 by over $4,500,000.

The number of passengers carried increased from 113,000,000 to 120,000,000, or 5.9 per cent. Passenger revenue, which amounted to 151,300,000 francs as against 142,800,000 from the same source in 1927, represented 36 per cent of the total receipts. Third-class passenger traffic accounted for 27.4 per cent of the total revenues, second-class for 6.8 per cent and first-class for only 1.8 per cent of the total.

Freight traffic, in spite of heavy road competition, rose 6.6 per cent over the 1927 figure—from 17,900,000 to 19,000,000 metric tons.—while freight revenues stood at 212,600,000 francs as compared with 201,100,000 in 1927.

Electric locomotives during 1928 were run 29,290,502 kilometers, or approximately 18,189,402 miles, as against 17,103,419 kilometers, or about 10,621,233 miles, made by steam locomotives. These figures are in decided contrast to those for 1927, when electric locomotives travelled 22,483,783 kilometers and steam locomotives covered 21,443,167 kilometers. Electrified lines now include 56.6 per cent of the entire Swiss Federal Railway system, carry approximately 85 per cent of the total traffic and represent an investment, for electrification alone, of 650,411,255 francs, or $130,082,251. The purchase during 1928 of 22 electric express locomotives and 16 electric switching locomotives brought the total number owned to 345 main line locomotives and 20 switchers. Sixteen motor coaches were also added during the year.

Despite the good showing made by the railways, highway competition is proving a serious factor in Switzerland. During 1928 a loss of approximately 10,000,000 francs in freight revenue alone was incurred from the use, by various industrial firms, of about 3,000 motor trucks of from three to five tons' capacity. The railways are attempting to meet this competition by developing and extending their own motor truck express service, which provides door-to-door collection and delivery. By the end of 1928 some 200 centers were connected by a regular motor service with 139 different stations on the Swiss railway system.

Railways of Japan in 1927-28

Gross revenues equivalent to $252,209,441, operating expenses of $140,430,001 and net revenue of $111,779,440 were reported by the Japanese Government Railways for the year ending March 31, 1928, according to statistics recently issued from Tokio. Deductions and other adjustments however brought the revenue figure down to $68,807,474 as the net profit for the year. The largest deduction was interest charges amounting to $37,165,398.

The foregoing figures of revenue, expenses and net profit for 1927-28 compare with those of the two preceding years as follows:

	Gross Revenues	Expenses	Net Profit
1927-28	$252,209,441	$140,430,001	$68,807,474
1926-27	241,073,312	134,877,821	65,191,825
1925-26	239,264,550	129,200,980	71,342,826

The private railways of Japan, consisting of 219 companies operating 3,413 miles of line, reported gross revenues of $37,198,846, operating expenses of $20,968,270 and net revenue of $16,230,576 for the year ending March 31, 1928. These figures compare respectively with 1926-27 private railway revenues of $34,201,098, operating expenses of $18,782,079 and net revenue of $15,419,019. Of the 219 private railway companies, 83 received subsidies from the government during the year. The aggregate amount granted in these subsidies was equivalent to $2,637,111. The 1927-28 operating ratio of these non-government lines was 56.4 as against that of 55.7 reported by the government railways.

The Government Railways during the year operated an average of 8,154 miles of line; the capital investment amounted to $1,423,679,412. Passenger revenues accounted for $138,918,503 of the 1927-28 gross, freight revenues were $109,702,252, while miscellaneous income amounted to $3,588,686. Freight and passenger revenues increased from the previous year, while there was a slight drop amounting to about $250,000 in the miscellaneous revenue. Of the expenditures the largest amount is headed "traffic," while transportation expenses comes second.

During the year these government lines performed a total of 65,191,569 passenger train miles and 35,286,646 freight train miles which yielded respectively 12,461,371,943 passenger-miles and 7,616,853,954 ton-miles. The number of passengers carried was 789,949,277, while 77,383,650 tons of freight were hauled. The average number of locomotives in use during the year was 2,681 out of 3,848 owned. The former averaged 113.4 miles per day and were in service on the average 15 hours, 18 minutes out of each 24.

The report states that during the year 647 steel passenger coaches were placed in service and continues to outline several innovations which were introduced to attract travelers to the railways. Researches on the construction of freight cars were also conducted and resulted in tests of five new types. These were: Steel cars with interior walls of wood on all sides, steel cars the same as the foregoing except that they had wooden doors, cars made entirely of steel, wooden cars and wooden cars with steel doors. It developed in these tests that the steel cars with interior walls of wood on all sides were best adapted to the Japanese climate.

New South Wales Railways Show Loss for Year

Although the government railways of New South Wales (Australia) earned a net operating profit of £4,637,566, or $22,538,571, equivalent to 3.82 per cent on the capital investment, during the fiscal year ending June 30, 1929, interest and sinking fund charges totaling £6,476,952, or $31,477,987, converted this into a loss for the year of £1,039,386, or $5,051,416, even after allowing for a government subsidy.

Total revenues stood at £19,615,616 ($95,331,894), an increase of £586,104 ($2,848,465) over the operating revenue of £19,029,512 ($92,483,428) for the fiscal period of 1927-1928. Operating expenses also increased by £221,723 ($1,077,574),

rising from £14,756,327 ($71,715,749) in 1927-1928 to £14,978,050 ($72,793,323) for the twelve months ending June 30, 1929. The net operating profit for the latter year represented an increase of £364,381, or $1,770,892 over that for the fiscal period ending in June, 1928. To the net operating profit was added a government subsidy for losses on the operation of developmental lines in sparsely settled territory of £800,000 or $3,888,000, but interest charges of £6,150,000 ($29,889,000) and sinking fund charges of £326,952 ($1,588,987) produced a net loss for the year. The operating ratio for the year was 76.36.

About 73 miles of new lines were opened for traffic during the year, bringing the total mileage in operation on June 30 to 5,940. This represented a total capital investment of £124,329,422, or $604,240,991. Of this amount £6,345,048 ($30,836,933) went into new construction or to physical improvements on older lines during the fiscal period under review.

The number of passengers carried increased from 148,046,881 in 1928 to 151,116,086 during 1929, with a resulting increase of £240,182 in passenger revenue. This increase was due entirely, however, to an increase of 3,492,298 second-class passengers carried by the suburban lines in the vicinity of Sydney. First-class passengers on these same lines decreased by 130,231, while first and second-class passengers on other lines decreased by 83,422 and 209,440 respectively, as a result of competition from motor coaches and private automobiles. Improved operation resulting from electrification of approximately 200 miles of line in the Sydney suburban area was mainly responsible for the increase of passenger traffic in that district. Passenger train miles run totaled 16,319,619.

Freight traffic, although showing a decline of 916,440 long tons handled, yielded a slight increase—£256,814—in revenue. The amount of coal and coke carried decreased by 1,272,965 long tons, while revenue from this source fell off by £178,056. Live stock shipments decreased 100,210 long tons and live stock revenue by £329,753. Both tonnage and revenue from minerals other than coal and coke declined slightly. Revenue from hay, straw and chaff increased, although the tonnage of these commodities carried was smaller than in 1927-1928. Shipments of grain, flour, etc., increased by 545,203 long tons and revenue from this source rose by £434,172. Shipments of wool, general merchandise and miscellaneous freight also increased, both in tonnage and revenue. The total long ton-miles handled were 4,590,238,645, while freight train miles operated were 9,680,832. The average haul per ton was 118.16 miles and the average earnings per long ton-mile were 1.45 pence, or approximately three cents.

During the year 106 locomotives were rebuilt and two new locomtives, 317 passenger coaches and 441 freight cars were added to the equipment of the railways. Miles of new line under construction at the end of the year totaled 191.

Traffic

The L.C.L. Corporation announces that a contract has been made with the Chicago, Burlington & Quincy for the use of L.C.L. containers on that road.

The annual banquet of the Transportation Club of Peoria will be held at the Hotel Pere Marquette on December 17. Frederick E. Williamson, president of the Chicago, Burlington & Quincy, will be the principal speaker.

The Central of New Jersey has put on a new fast express train, "The Bullet," between New York City and Wilkes-Barre, Pa. It leaves Wilkes-Barre at 7 a. m., and New York at 6 p. m., running through in 5 hours, 20 minutes, each way.

Senator Deneen, of Illinois, on November 2 requested President Hoover to ask the railroads to extend the emergency reduction in rates on export wheat, which expired on September 30, in order to move wheat from the West to the eastern seaboard.

The Interstate Commerce Commission has changed from November 25 to February 24 the effective date of its order of April 8 in Ex Parte No. 96 requiring the establishment of through routes and joint rates by the railroads and the federal barge lines of the Inland Waterways Corporation.

"Crating and Packing Commercial Store Fixtures" is the subject of Bulletin No. 19 which has been prepared by the Freight Container Bureau of the American Railway Association (30 Vesey street, New York City). The bulletin is issued in co-operation with the National Commercial Fixture Manufacturers' Association.

"The Everglades," through train between Boston, Mass., and Florida, now makes connection at Miami, Fla., with passenger planes of the Pan American Airways for Havana; time between Boston and Havana, 43 hours. This time is better than that made by airplane direct from Boston to Havana, as the railroad trains run all night while the airplanes fly only in the day time.

The traffic in fresh fish from Boston, Mass., to western and southern states, which has been steadily increasing within the past two or three years, had risen by the end of September to a point where the New York, New Haven & Hartford alone carried, in one month, 5,500 tons of this commodity, an increase of 1,800 tons over September, 1928. It is said that this remarkable increase in the sales of fish has been due largely to the adoption of the filleting process and to improved methods of chilling.

To spread knowledge of the region traversed by the St. Louis-San Francisco's new line to Pensacola, Fla., this company, on October 24, started out an exhibit car to visit towns and cities in six states. The car contains displays of resort features, mounted birds and fish, forest products, floriculture, preserved and fresh fruits and vegetables and horticultural and agricultural products numbering more than 700 exhibits. The car, which was built at the Frisco's shops in Springfield, Mo., has seats for 80 persons.

The State of New Jersey has filed with the Interstate Commerce Commission a complaint attacking the practice of railroads serving New York City of granting free lighterage and trucking service, either by inclusion in the regular rates or by making allowances therefor, on shipments to and from New York City. The complaint takes the position that this discriminates against the New Jersey cities located in the New York harbor district and asks the commission to require the establishment of rates with separately-published charges for lighterage and motor truck service.

Panama Canal Traffic

During the fiscal year ended June 30, 1929, there were 6,395 transits of the Panama canal by commercial vessels, exclusive of foreign naval vessels paying tolls on the basis of displacement tonnage (making 18 transits). Fifty-four and two-tenths per cent of the 6,395 commercial transits were by vessels of from 4,000 to 6,000 net tons, Panama canal measurement, 6.4 per cent by vessels under 1,000 net tons and 4.7 per cent by vessels over 8,000 net tons, including 86 transits by vessels of over 10,000 net tons. The average net tonnage of all transits was 4,666. The British ship *Belgenland* of 18,874 net tons, Panama canal measurement, was the largest commercial vessel transiting during the year.

The United States intercoastal trade, which is the largest trade through the canal and is restricted to vessels of United States registry, made up 29.3 per cent of the number of transits through the canal in 1929, and accounted for 32.9 per cent of the net tonnage, Panama canal measurement, 33.2 per cent of the tolls collected, and 33.0 per cent of the cargo carried. The increase in this trade, as a whole, has been slight during the past five years, due principally to the decline of shipments of mineral oils from California. This decline has been particularly marked in the past two years and has offset almost entirely the increases in other classes of shipping.

Fruit and Vegetable Shipments

New York City constitutes the largest market in the United States for fresh fruits and vegetables, according to a study just completed by the Bureau of Railway Economics into the origin and distribution of the 18 principal fresh fruits and

vegetables produced in the United States in 1928. More than 125,500 cars were unloaded in New York, approximately one-fifth of the total number of cars received at 66 principal markets. Chicago ranked second with 64,410 cars; Boston, third, with 36,839 cars; Philadelphia, fourth, with 34,121; Detroit, fifth, with 23,526 and Pittsburgh, sixth, with 21,535 cars.

Fresh fruits and vegetables, the study showed, have wide distribution, Cleveland and Detroit alone receiving supplies from 44 states; New York and Chicago from 43; Boston from 42; Columbus, Ohio, and Cincinnati and Milwaukee from 41; Philadelphia, Louisville and Indianapolis from 40; Pittsburgh, Birmingham and Minneapolis from 39; Atlanta, Jacksonville, Youngstown, Akron, Toledo and Terre Haute from 38; Buffalo, Newark, Memphis, Nashville, St. Paul and St. Louis from 37 and Balitmore, Dayton, Evansville and New Orleans from 36.

Fresh fruits and vegetables from California, Arizona and Washington, the study showed, reached all of the 66 markets, while those from Texas reached 65 and those from Florida reached 64. Fresh fruits and vegetables from Colorado and Oregon reached 63 of the principal markets, those from Idaho, 62, and those from Arkansas and Louisiana, 61.

Every state contributed to the supply of fresh fruits and vegetables unloaded in the 66 markets. California, the largest contributor, furnished 184,225 carloads; Florida furnished 57,895 carloads; New York, 33,861 carloads; Washington, 32,191 carloads; Virginia, 27,553 carloads; Maine, 24,600 carloads; Georgia, 24,509 carloads; Texas, 20,377 carloads, and Idaho, 17,303 carloads. The unloads originating in these nine states represented nearly 71 per cent of the total unloads in the 66 markets.

Freight Commodity Statistics

The tonnage of revenue freight carried by the Class I railways of the United States in the second quarter of 1929 amounted to 607,471,540 tons, an increase of 42,653,110 tons as compared with the corresponding quarter of 1928, according to the Interstate Commerce Commission's quarterly summary of freight commodity statistics. The tonnage of freight originated was 333,781,188, an increase of 25,411,572. All commodity groups except animals and products showed increases both in tonnage originated and tonnage carried. The summary for the United States follows:

Commodity group	Tons Originated			Tons Carried		
	Second Quarter			Second Quarter		
	1929	1928	Increase	1929	1928	Increase
Products of agriculture	20,420,316	19,989,296	431,020	44,421,921	42,735,965	1,685,956
Animals and products	5,977,417	6,068,654	d 91,237	11,041,116	11,124,926	d 83,810
Products of mines	182,615,042	168,214,355	14,400,687	310,354,847	291,307,462	19,047,385
Products of forests	26,172,944	24,492,242	1,680,702	51,057,787	48,144,755	2,913,032
Manufactures and miscellaneous	89,330,377	80,353,959	8,976,418	174,565,923	155,824,407	18,741,516
All L. C. L. freight	9,265,092	9,251,110	13,982	16,029,946	15,680,915	349,031
Total	333,781,188	308,369,616	25,411,572	607,471,540	564,818,430	42,653,110

* * * *

Underwood & Underwood

The Reconstructed Train Which Carried President Hoover and Thomas A. Edison Over the Grand Trunk Western to Smiths Creek for the Celebration of the Electric Light's Golden Jubilee at Dearborn, Mich.

Equipment and Supplies

Locomotives

THE MONTOUR is inquiring for two 2-8-2 type locomotives.

THE GEORGIA, ASHBURN, SYLVESTER & CAMILLA is inquiring for one 2-8-2 type locomotive.

THE MISSOURI PACIFIC is inquiring for five 4-8-2 type locomotives and 25 freight locomotives.

THE SEABOARD AIR LINE is now inquiring for five 2-10-0 type locomotives, ten 2-8-2 type locomotives and five six-wheel switching locomotives. In the *Railway Age* of October 19 this company was reported as inquiring for 15 locomotives.

THE DELAWARE, LACKAWANNA & WESTERN has ordered two "three-power" Diesel-electric-battery-locomotives to operate from a 3,000-volt trolley, from a Diesel-engine-driven generator or from a 360-cell storage battery. Each locomotive will be 47 ft. long, will weigh 248,000 lb. and will develop 1,640 brake horse power. The batteries will be of the Exide iron clad type, furnished by the Electric Storage Battery Company and will weigh 28,000 lb. The oil-electric engines will be built by the Ingersoll-Rand Company and the electrical apparatus by the General Electric Company. These locomotives are for service between Hoboken, N. J., and Secaucus, N. J. Inquiry for this equipment was reported in the *Railway Age* of September 21.

Passenger Cars

THE MISSOURI PACIFIC is inquiring for 10 all-steel parlor-coaches, 6 dining-parlor cars and 3 dining-club cars.

Freight Cars

THE WESTERN ELECTRIC COMPANY is inquiring for 15 flat cars of 100 tons' capacity.

THE TRANSCONTINENTAL OIL COMPANY has ordered 100 tank cars from the American Car & Foundry Company.

THE MISSOURI PACIFIC is inquiring for 1,250 box cars of 50 tons' capacity, 1,000 hopper cars of 70 tons' capacity and 35 steel underframe caboose cars.

THE NATIONAL RAILWAYS OF MEXICO have ordered 600 standard gage box cars and 200 gondola cars from the Standard Steel Car Company. An order was also given to the same builder for 240 sets of trucks for standard gage cars.

THE NEW YORK, CHICAGO & ST. LOUIS has ordered 10 steel underframes for caboose cars from the Canton Car Company. Inquiry for this was reported in the *Railway Age* of October 26.

THE SKELLY OIL COMPANY is inquiring for two tank cars of 50 tons' capacity.

THE CHEVROLET MOTOR COMPANY has ordered 20 hopper cars from the Standard Steel Car Company. Inquiry for this equipment was reported in the *Railway Age* of October 26.

THE ANGLO-MEXICAN PETROLEUM COMPANY, LTD., has ordered six single-compartment tank cars of 10,000 gal. capacity and five triple compartment tank cars of 10,000 gal. capacity from the General American Tank Car Corporation.

Iron and Steel

THE SOUTHERN is inquiring for 600 tons of steel for use in Georgia.

THE SOUTHERN PACIFIC is inquiring for 120,000 tons of rail.

THE DELAWARE & HUDSON has ordered 250 tons of steel from the American Bridge Company.

THE UNION PACIFIC has ordered 1,500 tons of structural steel for the Union Station building at Omaha, Neb., from the McClintic-Marshall Company.

THE BALTIMORE & OHIO has ordered 250 tons of steel for a bridge at Columbia, Ohio, from the American Bridge Company.

THE PENNSYLVANIA has ordered 15,000 tons of steel for station work at West Philadelphia, Pa., from the McClintic-Marshall Company and has ordered 500 tons for transmission towers from the American Bridge Company.

Signaling

THE READING COMPANY has contracted with the Union Switch & Signal Company for the installation of automatic block signals on its line between Sixteenth street, Philadelphia, Pa., and Shawmut, six miles, double track. Colorlight signals will be used. The order includes 50 switch indicators.

Machinery and Tools

THE CHICAGO, BURLINGTON & QUINCY is inquiring for a 1,500-ton hydraulic press for reshaping angles.

THE CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC has ordered a 25-ton gantry crane from the Milwaukee Electric Crane & Manufacturing Corporation.

DEMOUNTABLE WHEELS FOR SECTION MOTOR CARS.—A folder issued by the Fairmont Railway Motors, Inc., describes the new demountable wheels with bolted hub for section motor cars, which have recently been put on the market by this company. In addition to the advantages resulting from their use, which are mentioned, numerous illustrations show various types of motor cars already equipped with this wheel.

Supply Trade

The American Cable Company has moved its Chicago offices to the Daily News building, Room 1765, 400 West Madison street.

The Ball Railroad Time Service has moved its Chicago office to suite 914, Garland building, 58 East Washington street.

The St. Louis district sales office of **Cutler-Hammer, Inc.**, Milwaukee, Wis. has been moved from 611 Olive street to 1914 Washington avenue, St. Louis, Mo.

The Murry Jacobs Company, 544 South Pedro street, Los Angeles, Cal., now represents the Reading Chain & Block Corporation in southern California. **Harry T. Lynam** is in charge of the Los Angeles office.

W. J. Schlacks, formerly vice-president of the Locomotor Company, has been appointed railroad representative of the **Barber Asphalt Company** for the territory west, south, and southwest of St. Louis, with headquarters in the International Office building at St. Louis.

L. A. Hopkins, president of **Hopkins-Benedict Company,** Chicago, has sold his interest in this company to his brother **C. C. Hopkins,** who is now president and sole owner of the company. This firm acts as the railroad sales division of the Sisalkraft Company and district sales agents for the Boss Bolt & Nut Company, besides handling a varied line of railroad supplies.

The American Locomotive Company, has acquired control of the **McIntosh & Seymour Corporation,** Auburn, N. Y., as was reported in the *Railway Age* of November 2. The McIntosh & Seymour Corporation has manufactured Diesel engines for marine, stationary and transportation use since 1914. It is understood that the corporation will continue to operate under the present management, but as a subsidiary of the American Locomotive Company, and that no new financing would be required on the part of the American Locomotive Company. The two companies already have collaborated on the design and production of an oil-electric passenger locomotive.

The Miller Train Control Corporation, Staunton, Va., has entered into an agreement with the Crouse-Hinds Company, Syracuse, N. Y., for the manufacture and sale of the Miller "Trafilator," an electro-magnetic device for automatically controlling traffic signal lights at street and highway intersections and railroad grade crossings. The "Trafilator" employs the principle used in the Miller induction system of automatic train control. A detector unit, installed out of sight below the surface of the highway, is so affected by the passage over it of the iron and steel in a vehicle as to operate a relay and reverse a traffic light signal in accordance with predetermined timing arrangement.

The United States Steel Corporation has decided to exercise an option which it has held for the past several months on the properties of the Columbia Steel Corporation, San Francisco, Cal. The Columbia Company has plants at Pittsburgh and Torrance, Cal., also at Portland, Ore., and properties in Utah. The purchase of the Columbia properties has been determined upon by the United States Steel Corporation to provide a plant of its own on the Pacific Coast for supplying the increasing demands for steel of various kinds and to provide increased facilities in that locality. The present annual ingot capacity of the Columbia Company is 340,000 gross tons which is converted into a relatively narrow range of finished products. The properties are to be purchased at about $46,630,000 on February 1, 1930. The United States Steel Corporation's earnings for the first nine months of 1929 were 15.82 per cent upon the common shares out-standing as compared with 8.17 per cent for the same period of 1928, and an extra dividend of 1 per cent was recently voted upon the common stock. The corporation's plants are operating at 82 per cent of their ingot capacity at the present time.

Frank H. Crawford, western manager of railway sales of the industrial finishes division, of **E. I. duPont de Nemours & Company,** at Chicago, who has been promoted to eastern manager of transportation sales, having jurisdiction over railway, aviation and marine activities,

Frank H. Crawford

with headquarters at Parlin, N. J., was born on November 23, 1889, at Bristol, S. D. He was educated at River Falls, Wis., high school and the Wisconsin State Teachers College. After spending a few months with the Great Northern and three years in the wholesale hardware business at St. Paul, Mr. Crawford en-

tered the employ of the E. I. duPont de Nemours & Company in July, 1916, as an explosive salesman in Kentucky. He joined the army air service in 1917 and was discharged early in 1919, returning then to the duPont Company as an industrial salesman in the chemical products division. In March, 1924, he entered the railway sales department at Parlin, was transferred to Chicago in March, 1925, and appointed western manager railway sales December 1, 1925, which position he held until his recent promotion as above noted.

Obituary

Alexander L. Schuhl, manager of the Philadelphia office of the Independent Pneumatic Tool Company, died on October 20, after an illness of only a few days. Mr. Schuhl was born in Philadelphia on May 25, 1884. He joined the sales organization of the Independent Pneumatic Tool Company in 1917 and was appointed manager of the Philadelphia office in 1924.

Adolph F. Stark, vice-president of the Economy Arch Company, St. Louis, Mo., died suddenly of heart disease at Topeka, Kan., on October 22. Mr. Stark served an apprenticeship as mechanist and worked at this trade in many parts of the United States. In 1917 he became associated with the Locomotive Pulverized Fuel Company as service expert, continuing in this capacity with that company and its successor, the Combustion Engineering Corporation, until 1921, when be became vice-president of the Economy Equipment Corporation. He continued in that position until 1927 and since that time served as vice-president of the Economy Arch Company.

Trade Publications

PORTABLE ELECTRIC TOOLS—Catalog No. 897, issued by the Chicago Pneumatic Tool Company, is a 64-page pamphlet describing electric drills, reamers, screw drivers, nut runners, stud setters and tappers, grinders, buffers and sanders, which this company manufactures under the trade name of Hicycle portable electric tools. For their operation a current having a frequency of 180 cycles, is used to secure a rotor speed of 10,800 r.p.m., thus enabling a marked reduction to be made in the weight of the tools.

GAS-ELECTRIC RAILCARS AND LOCOMOTIVES.—Mack railcars and locomotives designed in co-operation with railroad engineers and operating authorities, car builders and electric equipment manufacturers are described and illustrated in a 9-in. by 12-in. catalogue issued by Mack Trucks, Inc., 25 Broadway, New York. These railcars and locomotives are produced expressly for railway service and are heavy-duty in character. The railcars are produced in three standard sizes: Light switching locomotives in three sizes, and industrial locomotives in two sizes. The power plants, control equipment and traction trucks being self-contained, the railcar equipment can readily be installed in existing coaches or new cars built to individual specifications.

HALL SYSTEM OF COOLING.—The Hall system of cooling, relating particularly to a cooling or refrigerating system especially adaptable for use in railroad and Pullman coaches and dining cars, is described and illustrated in an 18-page catalogue issued by the Arctic-Aire Company, Inc., Munsey Building, Baltimore, Md. This system of cooling, which is so designed that it operates off the present lighting circuit now used on passenger and Pullman coaches, provides for the use of a compression type of refrigerating unit to supply a suitable liquid refrigerant to the evaporator surrounding that portion of the supply pipe from which the drinking water is drawn off.

SCREW THREAD STANDARDIZATION.—This four-page brochure, by W. E. Sharp, was first prepared at the request of Columbia University, but subsequently received wide distribution at other colleges and universities. It sketches briefly the history of screw thread standardization from April 21, 1864, when William Sellers, president of Franklin Institute of the State of Pennsylvania, read a paper on "A System of Screw Threads and Nuts", which was subsequently published in the Journal of the institute. The "Sellers'" thread, which came to be known as the "U. S. Thread", came into general use through its wide adoption by American railroads and (1868) by the United States Navy. Following the World War, great impetus was given the system's development by the work of the National Screw Thread Commission (authorized by Congress July 16, 1919—H R 10852), which interested itself particularly in greater precision and more sharply drawn lines of tolerance limitations with a view to greater interchangeability of bolted parts. Adoption of the Commission's report by the American Society of Mechanical Engineers, the American Railway Association, the Society of Automotive Engineers, etc., is mentioned. The history concludes with a brief description of the "Grip Nut" (invented 22 years ago), a lock nut which has full U. S. Standard threads, and whose locking power is built into it during manufacture by especially developed and improved automatic machinery. The author is of the opinion that the adoption of the American National Standard, recently promulgated by the National Screw Thread Commission, will give rise to some confusion, due to the multiplicity of wrench openings required in the concurrent use of the two standards, United States and American National, identical in thread form but differing in external dimensions. The brochure is published by Grip Nut Company, 5917 South Western avenue, Chicago.

Construction

CENTRAL OF NEW JERSEY.—A contract has been awarded to the Nicholson Company, Inc., of New York City, for the construction of a coal storage plant at Caven Point, Jersey City, N. J., at a total cost of $56,500.

DELAWARE & HUDSON.—The Public Service Commission of New York has approved plans for the elimination of the Currier Corners-Fort Amherst highway grade crossing in Crown Point, New York.

ERIE-PENNSYLVANIA.—General plans for the elimination of the Black Creek-Belfast highway grade crossing of these companies' tracks in Belfast, N. Y., have been approved by the Public Service Commission of New York.

GREAT NORTHERN.—A contract for the construction of a water supply reservoir at Bainville, Mont., has been awarded to A. Guthrie & Co., St. Paul, Minn. The reservoir, which will be 150 ft. wide, 1,500 ft. long and about 20 ft. deep, involves the excavation of approximately 100,000 cu. yd. of material.

LEHIGH & NEW ENGLAND.—A contract has been awarded to the M. A. Long Company of Baltimore, Md., for the construction of an office building at Allentown, Pa.

MISSOURI PACIFIC.—This company has awarded to the M. A. Long Company, Baltimore, Md., a contract for the construction of a grain elevator between Martin avenue and the Missouri Pacific southwest junction yard at Kansas City, Mo. The approximate cost is $145,000.

NEW YORK CENTRAL.—Approval has been given by the Public Service Commission of New York to this company to make changes in its general signal system in connection with the elimination of the Austin, Amherst, Tonawanda and other street crossings of the Erie, Canadian National, Delaware, Lackawanna & Western and New York Central in Buffalo, N. Y. The additional cost of the work, estimated at $50,000, together with the cost of a proposed interlocking signal system, is to be borne by the New York Central. Additional work, if any, to provide facilities for the other railroads will be as hereafter determined by the Commission. The Commission also approved detailed plans and estimates of cost totaling $1,300,100 covering the cost of track changes on the New York Central, Erie and Canadian National, but exclusive of signal and telephone work for the Erie.

NORTHERN ALBERTA.—Announcement is made in Montreal, jointly by Sir Henry Thornton and E. W. Beatty, presidents, respectively, of the Canadian National and Canadian Pacific, of the branch line program to be commenced in 1930 by the Northern Alberta Railways. The presidents of the two systems, which jointly

own the Alberta Railways, point out that under the agreement for acquisition the purchasers undertook to build within five years 60 miles of branch lines, in addition to the branches under construction by the government of Alberta at the time the purchase was made. To meet the traffic needs of the district, and in fulfilment of statements previously made, the directors of the Northern Alberta Railways have, therefore decided to recommend to the government and to the directors of the Canadian Pacific, the commencement in 1930 of a line from Hythe to Rolla, a distance of 50 miles, and from Fairview westerly, a distance of 15 miles. In addition, the Northern Alberta Railways will, during the coming year, undertake to investigate the traffic possibilities of an extension west from Spirit River and from a point at or near Grimshaw to serve the Battle River district, in which considerable settlement has taken place.

PERE MARQUETTE.—A contract has been let to the Roberts & Schaefer Company, Chicago, for the installation of an electric locomotive coaler at St. Thomas, Ont.

PITTSBURGH & WEST VIRGINIA.—C. V. Burnside, assistant director of the Bureau of Finance of the Interstate Commerce Commission, has submitted a proposed report recommending that the commission authorize the construction of this company's proposed line from a point on its Connellsville extension near its crossing of Pigeon Creek, to Baird, Pa., on the Donora Southern, 6 miles.

UNION PACIFIC.—Company forces have undertaken the installation of an 85-ft. turntable at Lincoln, Neb., at a cost of about $27,000, to replace a smaller turntable. Company forces have also begun the construction of an overhead crossing at Parco, Wyo., which will require the expenditure of $27,000. A contract for the construction of a new freight and passenger station at Julesburg, Colo., at a cost of about $38,000 has been awarded to H. E. Schraven, Salt Lake City, Utah. A contract has been let to Mont J. Green, Manhattan, Kan., for the construction of five maintenance of way dwellings between Upland, Kan., and Hastings, Neb.

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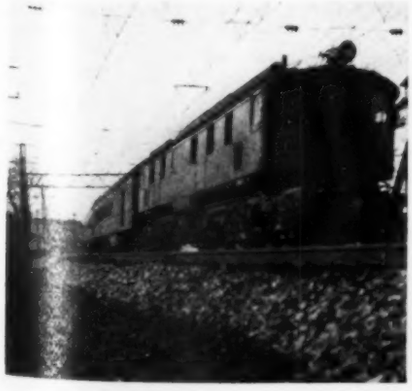

The Merchants Limited in the Electrified Zone of the N. Y., N. H. & H.

Railway Finance

BALTIMORE & OHIO.—*Bonds.*—The Interstate Commerce Commission has authorized various subsidiaries of the B. & O. to issue bonds to be delivered to the B. & O. or its nominee in partial payment of advances for capital purposes, as follows: Baltimore & Ohio Chicago Terminal, $848,000; Schuylkill River East Side, $702,000; Baltimore & Ohio in Pennsylvania, $644,000; Coal & Coke, $95,000; Pittsburgh Junction, $21,500; Quemahoning Branch, $435,000; Baltimore & Ohio Southwestern, $4,565,500; Washington County, $4,000; Pittsburgh & Western, $533,500; Confluence & Oakland, $3,500; Ohio & Little Kanawha, $101,000; Wheeling, Pittsburgh & Baltimore, $224,000; Fairmont, Morgantown & Pittsburgh, $153,500; Baltimore & Philadelphia, $55,500; Toledo & Cincinnati, $1,483,000. The Baltimore & Ohio also was authorized to issue for pledge $1,483,000 for Toledo-Cincinnati division first-lien and refunding mortgage 6 per cent bonds.

BOSTON & MAINE.—*Stock.*—The Interstate Commerce Commission has authorized an issue of $7,500,000 of 7 per cent prior-preference stock, to be exchanged for the company's mortgage bonds at the rate of five shares of stock for each $500 principal amount of bonds.

BUFFALO, ROCHESTER & PITTSBURGH.—*Special Argument Asked by D. & H. Denied.*—The Interstate Commerce Commission has denied a petition filed by the Delaware & Hudson for a special argument on its motion that the commission dismiss the proceedings on the application of the Baltimore & Ohio for authority to acquire control of the Buffalo, Rochester & Pittsburgh.

CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC.—*Reorganization Plan.*—The Supreme Court of the United States has issued a finding of probable jurisdiction on an application of the Interstate Commerce Commission for a review of a decision of the district court for the northern district of Illinois, which had held invalid conditions attached by the commission to its order authorizing the issuance of securities in connection with the reorganization. One of the conditions was that the company should not pay any underwriting fee.

FAIRCHILD & NORTH-EASTERN.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon its line from Fairchild, Wis., to Greenwood, Wis., 23.5 miles, provided no offer for its purchase equivalent at least to its junk value is made therefor.

GOSHEN & DECKERTOWN.—*Bonds.*—The Interstate Commerce Commission has authorized this company to extend from November 1, 1929, to November 1, 1979, the maturity of $60,000 of its second mortgage 6 per cent bonds.

HILL CITY.—*Sale of Road.*—This 25-mile railroad the abandonment of which the Interstate Commerce Commission authorized on December 22, 1928, has been sold by Armour & Co., to the Hill City Community, a group headed by Thomas Brusegard of Hill City, Minn., for $25,000.

HILL CITY.—*Abandonment.*—The Interstate Commerce Commission has set aside its order permitting the abandonment of the line of this company extending from Mississippi Jct., Minn., to Hill City, 17.5 miles, residents of the latter community having acquired the property from its former owners with the purpose of maintaining service.

LOWELL & SOUTHERN.—*Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue $200,000 of stock, for the purpose of financing the construction of its proposed line.

MERIDIAN & BIGBEE RIVER.—*Acquisition.*—An application has been filed with the Interstate Commerce Commission for authority to acquire and operate a logging road from Cliff Williams to Crandall, Miss., 25 miles, by lease from S. A. Neville.

MERIDIAN & BIGBEE RIVER.—*Securities.*—This company has applied to the Interstate Commerce Commission for authority to issue $600,000 of common stock and $1,500,000 of 6 per cent ten-year bonds to finance the construction of its line from Meridian to Myrtlewood, Ala.

MICHIGAN CENTRAL.—*Bonds.*—In an application to the Interstate Commerce Commission this company asks authority to guarantee $6,735,000 of 50-year 5 per cent bonds to be issued by the Canada Southern and to be taken by the applicant at par for advances.

NEW ORLEANS GREAT NORTHERN.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon a branch line from Covington Junction to Folsom, La., 12.2 miles.

NEW YORK, CHICAGO & ST. LOUIS.—*Notes.*—The Interstate Commerce Commission on November 6 authorized this company to issue a promissory note or notes for $20,000,000 to be sold at not less than 98 and interest and the proceeds to be used to purchase from the Alleghany Corporation certificates of deposit for Wheeling & Lake Erie capital stock which is deposited with a trustee pending decision by the commission as to the ultimate disposition of the control of the Wheeling. The authority was granted on the express condition that the Nickel Plate shall not, except by authorization of the commission, attempt to ex-

ercise through the ownership of the certificates, any control over the affairs of the Wheeling. Commissioner Eastman dissented. Commissioner Woodlock, in a concurring opinion, expressed the opinion that it is highly desirable that the ownership of the entire beneficial interest in the stocks of the Wheeling shall be lodged in a carrier over which the commission has supervision "in view of the doubt surrounding the degree of control, if any, which we could exercise over the Alleghany Corporation in this matter."

PENNROAD CORPORATION.—*Control of P. & W. V.*—It is reported, but not as yet officially confirmed, that this corporation the voting trustees of which are officers of the Pennsylvania Railroad, has acquired the holdings of the Taplin brothers in the Pittsburgh & West Virginia, which would involve control of that property.

PENNSYLVANIA. — *Acquisition.* — This company has applied to the Interstate Commerce Commission for an order approving the purchase of $2,000,000 of stock of the New York & Long Branch at par which will give it a one-half interest with the Central of New Jersey. The Pennsylvania in its application says it does not concede the jurisdiction of the commission in the matter but that its application is filed in order to obtain action by the commission on the pending application of the N. Y. & L. B. for authority to issue the stock to reimburse the Pennsylvania and the Central for advances.

ST. LOUIS SOUTHWESTERN.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to nominally issue $1,841,000 of first terminal and unifying mortgage bonds, to reimburse the treasury in part for advances for additions and betterments on leased lines.

WHEELING & LAKE ERIE.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue and sell at 94 and interest $409,000 of 5 per cent refunding mortgage bonds for the purpose of taking up an equal amount of extension and improvement mortgage bonds to be deposited with the trustee of the refunding mortgage as collateral security.

Dividends Declared

Alabama Great Southern.—Ordinary, $2.00, semi-annually; Ordinary, extra, $1.50, both payable December 27 to holders of record November 27; Preferred, $2.00, semi-annually, Preferred, extra, $1.50, both payable February 13 to holders of record January 10.

Delaware & Hudson.—$2.25, quarterly, payable December 20 to holders of record November 26.

Georgia Southern & Florida.—First Preferred, $2.50, semi-annually; Second Preferred, $2.50, semi-annually, both payable November 27 to holders of record November 13.

New York, Chicago & St. Louis.—Common, $1.50, quarterly; Preferred, $1.50, quarterly, both payable January 2 to holders of record November 15.

Average Prices of Stocks and of Bonds

	Nov. 6	Last week	Last year
Average price of 20 representative railway stocks..	125.73	126.78	123.38
Average price of 20 representative railway bonds...	91.37	91.38	94.37

Railway Officers

Southern Pacific Reorganizes Traffic Department

The executive committee of the Southern Pacific Lines, at a meeting at New York on October 31, approved the complete reorganization of the traffic department of the railroads which make up that sytsem in order to effect improved co-ordination of the activities of the various units and to adopt uniform policies in the supervision and development of traffic. The changes, which became effective on November 1, involve 27 traffic officers and include the creation of three new vice-presidencies, one for the direction of freight traffic and one for the direction of passenger traffic on the system and a third for the direction of both freight and passenger traffic on the lines in Texas and Louisiana.

In addition to the creation of the positions of general freight traffic manager and general passenger traffic manager for the Pacific lines, that territory has been divided into three districts, with freight traffic manager and passenger traffic manager in charge of each and a freight traffic manager and a passenger traffic manager at Chicago. Under the vice-president and traffic manager of the Texas and Louisiana lines there has been placed a freight traffic manager and a passenger traffic manager. The solicitation and development of traffic in the eastern territory will be taken care of by officers who will have the titles of general eastern freight agent and general eastern passenger agent at New York.

J. T. Saunders, freight traffic manager of the Pacific lines, and **F. S. McGinnis,** passenger traffic manager of those lines, both with headquarters at San Francisco, Cal., have been appointed vice-presidents in charge of freight traffic and passenger traffic respectively of the Southern Pacific system and the Southern Pacific Steamship Lines with offices at San Francisco and Houston, Tex. They will have general supervision and control over the traffic of those companies, the solicitation and development of traffic interchanged with other companies and the establishment of rates and divisions incident thereto. **C. S. Fay,** traffic manager of the lines in Texas and Louisiana, has been appointed vice-president and traffic manager of those lines and will have immediate supervision and charge of both freight and passenger traffic, with headquarters as before at Houston.

H. A. Hinshaw, assistant freight traffic manager of the Pacific lines, has been promoted to general freight traffic manager of those lines, with headquarters as before at San Francisco. **E. W. Clapp,** traffic manager for the system at Chicago, has been appointed general passenger traffic manager of the Pacific lines, with headquarters at San Francisco.

H. C. Hallmark, assistant freight traffic manager, has been promoted to assistant general freight traffic manager, with headquarters as before at San Francisco. **M. A. Cummings,** general freight agent at San Francisco, **F. E. Scott,** assistant freight traffic manager at Los Angeles, Cal., and **J. H. Mulchay,** assistant freight traffic manager at Portland, Ore., have been promoted to freight traffic managers at those respective points. **F. H. Plaisted,** now freight traffic manager at Chicago, will continue in that position. **C. T. Collett,** freight assistant at Chicago, has been promoted to assistant freight traffic manager at that point. **O. P. Bartlett,** passenger assistant at Chicago, has been promoted to passenger traffic manager at the same point. Mr. Plaisted and Mr. Bartlett will have supervision and control of the solicitation and development of freight and passenger traffic in the middle western and eastern territory. **H. W. Klein,** assistant general freight agent, has been promoted to general freight agent, with headquarters as before at San Francisco. **L. C. Zimmerman,** assistant general freight agent, with headquarters at Los Angeles, Cal., has been transferred to San Francisco, and he has been succeeded by **A. M. Levy,** who has been transferred from the position of assistant general freight agent at El Paso, Tex. **W. H. Francis** has been appointed assistant general freight agent at El Paso to replace Mr. Levy. **S. C. Chiles,** general agent of the freight department, and **H. H. Gray,** general agent of the passenger department, at New York, have been appointed general eastern freight agent and general eastern passenger agent respectively, with headquarters as before at New York.

F. C. Lathrop, assistant passenger traffic manager at San Francisco, **C. L. McFaul,** assistant passenger traffic manager at Los Angeles, and **J. A. Ormandy** assistant passenger traffic manager at Portland, have been appointed passenger traffic managers, with headquarters at the same respective points. **N. Kinell,** assistant passenger traffic manager, and **F. E. Watson,** general passenger agent, have been promoted to assistant general passenger traffic managers, with headquarters as before at San Francisco. **J. E. Warren** has been appointed assistant to the general passenger traffic manager, with headquarters at San Francisco.

S. G. Reed, assistant traffic manager in charge of freight on the Texas and Louisiana lines, has been appointed freight traffic manager of those lines, with headquarters as before at Houston. **J. T. Monroe,** assistant traffic manager in charge of passenger traffic, has been appointed passenger traffic manager, with headquarters at Houston. **T. G. Beard,** general freight agent, has been promoted to assistant freight traffic manager, with headquarters as before at Houston.

Executive

A Correction

An error was made in the headline of an article in the *Railway Age* of October 12, regarding official changes on the Chicago Great Western. The error was in the statement that Samuel M. Felton retired as chairman of the board. Mr. Felton was elected chairman of the board at the annual meeting of the company last April, and continues in that capacity.

Financial, Legal and Accounting

M. **Peterzon,** district auditor on the Southern Pacific, has been promoted to assistant auditor of disbursements, with headquarters at San Francisco, Cal.

Operating

A. R. Savage has been appointed superintendent of mine service of the Atlantic Coast Line, with headquarters at Mulberry, Fla.

J. H. Michaeli has been appointed superintendent of transportation of the Safety Refrigeration, Inc., with headquarters at New Haven, Conn. **G. C. Coffee** has been appointed superintendent of refrigeration, with headquarters at the same point.

D. A. Day has been appointed superintendent of car service of the Michigan Central and the Chicago, Kalamazoo & Saginaw, with headquarters at Buffalo, N. Y. **E. S. Jackson** and **G. C. Barnum** have been appointed assistant superintendents of car service, with headquarters in the same city.

W. C. Baker, assistant superintendent of the St. Louis division of the Baltimore & Ohio, has been promoted to superintendent of that division, with headquarters as before at Washington, Ind. Mr. Baker succeeds **C. G. Stevens,** who has been transferred to the Newark division, with headquarters at Newark, Ohio, where he replaces **H. R. Gibson,** who has been transferred to the Monongah division, with headquarters at Grafton, W. Va. Mr. Gibson succeeds **T. K. Faherty,** who has been transferred to the Akron division, with headquarters at Akron, Ohio, to replace **H. G. Kruse,** who has been assigned to other duties because of ill health.

Joseph R. Cameron, who has retired as assistant general manager of the Western region of the Canadian National, with headquarters at Vancouver, B. C., has completed 47 years of railway service. He was born at Truro, N. S., on November 5, 1865, and attended the Model School in that city. In 1882 he entered railway service on the Canadian Pacific in Manitoba and four years later he became connected with the Northern Pacific at Winnipeg, Man., and then at Grand Forks, N. D. In 1902 Mr. Cameron was appointed superintendent of the lines of the Canadian Northern (now part of the Canadian National) under construction, with headquarters at Winnipeg, and in 1906 he was promoted to superintendent in the operating department at Port Arthur, Ont. He was further promoted to general superintendent of the Western lines at Winnipeg in 1908 and in 1911 he was promoted to assistant general manager, with headquarters at the same point. On September 1, 1920, Mr. Cameron was appointed assistant general manager of the Canadian National at Vancouver, a position he held until his retirement.

Traffic

H. G. Feth, assistant to the general freight agent of the Chicago & Eastern Illinois, has been promoted to assistant general freight agent, with headquarters as before at Chicago.

William G. Klein, grain and flour agent of the Chicago, St. Paul, Minneapolis & Omaha, has been appointed general agent of the freight department at Minneapolis, Minn. **Clarence E. Collins** has been appointed grain and flour agent at Minneapolis, succeeding Mr. Klein.

L. A. Clapp, division freight agent of the New York Central, with headquarters at Albany, N. Y., has been appointed division freight and passenger agent at Corning, N. Y., succeeding **R. K. Horton,** promoted. **F. E. McGrath,** division freight agent at New York, will succeed Mr. Clapp as division freight agent at Albany. He will in turn be replaced by **H. J. French, Jr.**

In order that the increasing volume of milk transported over the lines of the Pennsylvania may be more efficiently handled the following changes have been made in the milk traffic department. **W. L. Buchanan,** milk traffic agent, will continue to have his headquarters in Philadelphia. He will conduct the work in the Eastern region and the New York Zone, and will exercise general supervision over activities of the entire system. **C. D. Lechliter** has been appointed milk freight agent of the Central region with headquarters at Pittsburgh, Pa., and **H. P. Bates** will occupy a similar position with jurisdiction over the Western region, with headquarters at Chicago. The two latter positions are newly created.

Engineering, Maintenance of Way and Signaling

John F. Murray, recently appointed engineer in charge of the Baltimore improvements of the Pennsylvania, with headquarters at Baltimore, Md., resigned from the service of that road on October 16.

Douglas M. Burckett, who has been appointed electrical engineer of the Boston & Maine, with headquarters at Boston, Mass., was born on December 18, 1895, in Brooklyn, N. Y. He was educated at the Massachusetts Institute of Technology and entered railway service in January, 1926, as assisstant engineer for the Great Northern at Seattle, Wash. He served in that capacity until January, 1929, when he was appointed assistant electrical engineer of the Great Northern at the same point. During the period Mr. Burckett

Douglas M. Burckett

served as assistant engineer he was in charge of the design and construction of all catenary and transmission line work of the 72 route miles of main line electrification on the Cascade division. This work included the electrification and servicing of the new eight mile tunnel through the Cascades which was opened in January of this year. Mr. Burckett was appointed electrical engineer of the Boston & Maine on October 15, 1929, in charge of the design and putting into service of all electrical and mechanical projects. Prior to entering the service of the Great Northern, Mr. Burckett had been identified with the Sydney E. Jenkins Co. in making electrification studies for the Canadian Pacific.

Purchases and Stores

John E. Mahaney, who has been appointed general supervisor of stores of the Chesapeake & Ohio, the Hocking Valley and the Pere Marquette, with headquarters at Cleveland, Ohio, has been connected with railway purchasing and stores departments, principally in the west, for 35 years. He was born at St. Paul, Minn., on December 23, 1875, and was educated in the public schools of that city. On November 22, 1894, he obtained his first railway experience as a counter boy in the general store department of the Minneapolis, St. Paul & Sault Ste. Marie. Five years later he became general foreman in the store department of the Eastern Minnesota (now part of the Great Northern) at West Superior, Wis. From 1901 to 1916, Mr. Mahaney served successively

as storekeeper for the Soo line at Gladstone, Mich., foreman in the stores department of the Chicago, Rock Island & Pacific at Chicago, storekeeper on the Southern Pacific at Sacramento, Cal., general storekeeper of the Oregon-

John E. Mahaney

Washington Railroad & Navigation Company at Portland, Ore., purchasing agent of the Spokane, Portland & Seattle, the Oregon Trunk, the Oregon Electric and the United Railways at the same point and general storekeeper of the Norfolk & Southern at Berkley, Va. During 1918 and 1919 he acted as supervisor of stores of the Northwestern region of the United States Railroad Administration and he was then appointed general storekeeper of the Seaboard Air Line, with headquarters at Portsmouth, Va. Mr. Mahaney became superintendent of stores of the Chesapeake & Ohio, with headquarters at Richmond, Va., in May, 1921, a position he held until his promotion to general supervisor of stores of that road, the Hocking Valley and the Pere Marquette on November 1.

Obituary

J. D. Mansfield, general freight agent of the Western Pacific, with headquarters at San Francisco, Cal., died in that city on October 25.

Joseph H. Settle, division passenger agent of the Louisville & Nashville, with headquarters at Birmingham, Ala., died in that city on November 2 after a short illness.

Robert J. Cary, vice-president and general counsel of the New York Central, with headquarters at New York, died of heart disease at his home in that city on November 6.

Charles C. Gignoux, assistant supervisor of agriculture of the Oregon-Washington Railroad & Navigation Company, with headquarters at Portland, Ore., died in that city on October 27.

Eugene M. Young, superintendent of the McCloud River railroad, with headquarters at McCloud, Cal., died in Berkeley, Cal., on October 28. Mr. Young had been in the service of the McCloud River for 29 years.

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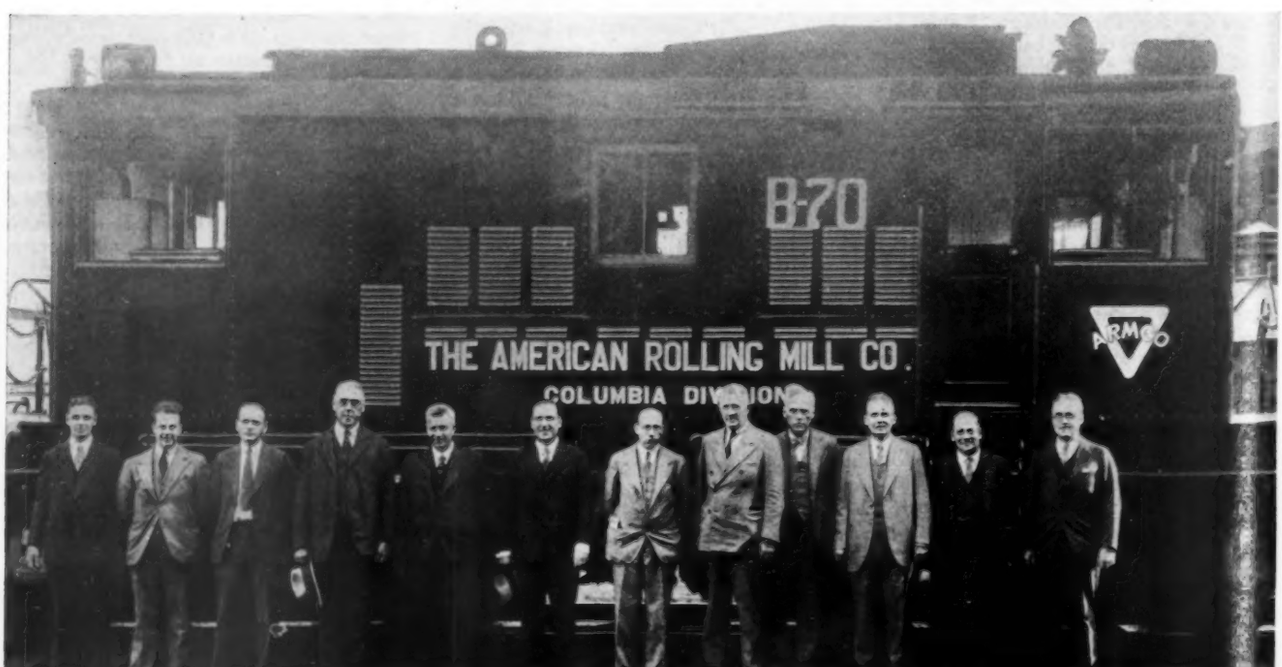
B. H. Layne, trainmaster of the Arkansas division of the Missouri Pacific, with headquarters at Little Rock, Ark., died at his home in that city on October 8, after a short illness. Mr. Layne was promoted to trainmaster at Little Rock on July 1, 1928, after having served the Missouri Pacific as telegrapher and dispatcher since 1904.

Sylvester S. Bliss, assistant treasurer of the New York Central, with headquarters at New York, died of pneumonia at his home in Tarrytown, N. Y., on November 1. Mr. Bliss had been connected with the New York Central since January, 1887, when he entered the service of that company as a clerk in the paymaster's office. He later served as cashier, being appointed assistant treasurer of the road in 1928.

U. S. Steel Products and Publications.—The United States Steel Corporation, 71 Broadway, New York, presents in a 52-page pamphlet the following information concerning its subsidiary manufacturing companies: Products and by-products manufactured location and addresses of sales offices; location and addresses of warehouses; publications descriptive of products; description of educational motion pictures, and an alphabetical index of products. No attempt is made to cover the more specialized or detailed products or processes of any of the companies, but the lists are representative of the type and character of commodities made.



Inspecting an Oil-Electric Locomotive, Built Jointly by the W estinghouse Electric & Manufacturing Company and the Baldwin Locomotive Works, for Switching Ladle Cars

Left to right: W. E. Sylvester, Canadian National; John Dixon, chief engineer, William Beardmore & Co., Ltd., Glasgow, Scotland; G. B. Karelitz, research engineer, Westinghouse Electric & Manufacturing Co.; H. T. Herr, vice-president, Westinghouse Electric & Manufacturing Co.; C. E. Brooks, chief of motive power, Canadian National; G. H. Froebel, assistant director of heavy traction, Westinghouse Electric & Manufacturing Co.; D. W. R. Morgan, Westinghouse International Co.; R. G. Gage, chief electrical engineer, Canadian National; N. W. Storer, consulting engineer; H. U. Hart, vice-president Canadian Westinghouse Co.; D. C. Hershberger, general engineer and T. C. Wurts, head, heavy traction section, Westinghouse Electric & Manufacturing Co